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No. VII. OF VOL. II., 1924. **No. 5268. Vol. CCVII.** LONDON, SATURDAY, AUGUST 16, 1924. Founded 1823. Registered as a Newspaper. Published Weekly. Pp. 112—**Price 1s.** Annual Subscription Inland £2 2s. Abroad £2 10s

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THE CONSISTENCY OF NATURE.

FORTUNATELY for physiology and medicine many human functions are sufficiently akin to those of animals to make it possible to apply the results obtained by studying one reciprocally to the other. Recent advances in medicine make it indeed unnecessary to emphasise this fact. Fortunately too many organs, especially in the lower animals, can be made to function apart from the body; we may, so to speak, isolate our variables and examine them one at a time. It is probable that a great field of research lies in the future before a study which is still quite young, that of tissue cultures. Fortunately, too, nature is consistent—though to believe that this is so requires on occasions a certain amount of scientific faith. It is a great reward to that faith when examples of this consistency appear, as indeed they do in the subject on which I am to have the privilege of speaking to you.

ACADEMIC PHYSIOLOGY.

The study of muscle and nerve was for long one of the chief activities of many of the finest intellects in physiology. I need mention only a few, the names of Burdon-Sanderson and Gotch, of Helmholtz, Fick, and Blix, of Keith Lucas, Gaskell, and Mines. The strongest motive—indeed, the only good motive—for investigating a "useless" and academic subject is the same as led Pasteur to study optical activity, or the physicists of the last century to study the conduction of electricity through gases—viz., an interest in the phenomena for their own sake. One knows now the practical importance of Pasteur's work, X rays and wireless telegraphy are a sufficient practical illustration of the value of physics. It would, indeed, be unnecessary here to advocate, to make an apology for, these academic studies, were what is said here not sometimes heard outside. The fact that you have done me the honour of inviting me to give these lectures is a sign that you, at any rate, do not regard the apparently useless as not to be encouraged. The best motive, because the most effective, in investigation and research, is simply the desire for knowledge, not merely the pursuit of power or money, or even the improvement of the amenities of human life. The desire to prevent suffering, noble in itself as it is, would never of itself have led to the discovery of X rays, nor will it lead to the elimination of diseases produced by filter-passing organisms or of the scourge of cancer. One's head, indeed, must be tempered by one's heart, but one's head is still the organ by which intelligent progress is made.

In physiology, however, the young people whom one has to teach are often so severely practical; they have escaped from the "useless" learning of school, they have "put away childish things," and if one wants to tell them about the refractory period of nerve or the recovery process in muscle, they say—sometimes openly to oneself, almost invariably to one another—"What is the use of that? What application can this have in the wards?" and they go off probably—small blame to *them*—to someone else, who will cram them better for their examinations so that they may get on the quicker with something useful.

An opposition, however, is not a bad thing, as Parliamentary Government shows. No dictatorship, least of all in science, is good, either for the dictator or for those to whom he dictates. It is an excellent thing for our students to be free to ask us, "What is the use of this, or that?" and to have us reply that it is no use—at any rate, at present—that we do not tell them things because they are useful, but because they are interesting. It is a great stimulus to us to have to find applications, in living man, of the facts discovered on portions of frog or cat; indeed, the greater part of the information which I hope to discuss with you in my second lecture was acquired directly under that kind of stimulus. One told one's students about lactic acid and the recovery process in isolated muscle; the presence in the laboratory at Manchester of my colleague, Dr. F. W. J. A. Lamb, with a special sub-department of human physiology, together with the ever-present, if unexpressed, desire of one's students to hear about man rather than about the frog, led one to see how application could be made. My colleagues, Lupton and Long, aided by the Medical Research Council, have made many of the applications which I hope to describe in my second lecture.

Mutual Dependence of the Theoretical and Practical.

To every action there is an equal and opposite reaction. Often, after the first step has been made on the academic side and applied on the practical side, the latter reacts on the former by suggesting further problems, by providing a new or a better technique. One can see it in physics; physical progress depends largely on instruments and technique. Technology requires, with a certain latent period, the new advance on the theoretical and academic side. To take a personal example, I have recently been privileged to collaborate with my friend Prof. Gasser, of St. Louis, in an extraordinarily interesting development of a very old subject, one that we, like many other people, had thought moribund, the mechanics of muscular contraction. This work arose directly from, and I think might never have arisen without, a series of experiments made three years ago on the relation between speed and efficiency in human muscular movement, a subject of practical, even of industrial, importance. Those experiments, in their turn, had arisen from a study of the thermodynamics and the absolute efficiency of muscular movement in the frog. To take another example. Experiments on the electric change in isolated tissues led to the study of the human electrocardiogram; the phenomena of fibrillation and flutter in man led to the further study of circus movement in the exposed mammalian heart and of the changes of refractory period associated therewith. This in its turn will lead to further knowledge of human cardiac disorders. To take a third example. The importance of human diabetes has long stressed the interest of pancreatic function in animals; that has led to the discovery of insulin, a subject not only of great practical importance, but of very considerable scientific interest in relation to metabolism, oxidation, and, ultimately, to the mechanism of muscle. We academic physiologists must not be ungrateful to our students and our practical medical friends—our Parliamentary opposition—if they stimulate us to widen our views and prove the practical application of our studies; for the needs and problems of those applications will, and must, react in the end to our good.

Let me now, after this attempt at an apology, turn to my thesis.

MUSCULAR FATIGUE.

The isolated muscle stimulated in air, or in Ringer's solution saturated with air, with more than a certain frequency, rapidly fatigues; stimulated with a lower frequency, it lasts a longer time; stimulated infrequently it may remain alive for several weeks. If maintained in Ringer's solution saturated with oxygen, it may be stimulated every ten seconds for several days; with very frequent stimulation it is completely exhausted in a few hundred twitches. Left without oxygen, it never recovers from this fatigue; in a few hours it goes into rigor and dies. Left in oxygen, however, it completely recovers, its contracture disappears, and it is ready to function again as well as ever. Moreover, in oxygen it will rapidly reach a steady state (Fig. 1) in which breakdown in activity is balanced exactly by restoration in recovery. This steady state in oxygen, which was

first clearly pointed out by Fletcher, is of peculiar importance when we come to study prolonged human muscular activity.

LACTIC ACID.

Such observations on the isolated muscle led to a study of lactic acid—its accumulation in activity, its removal in recovery. Fletcher and Hopkins's experiments, published in 1907, are now the basis of all muscle physiology. In a muscle left at rest in oxygen the lactic acid concentration never increases and may decrease; in a muscle left in air, it increases slowly; more rapidly, however, in inert gases such as hydrogen or nitrogen. If a muscle be subjected to some harmful influence, such as mechanical injury, coal-gas, alcohol, or chloroform, its lactic acid content increases rapidly. This anaerobic production of lactic acid is increased by a rise of temperature, an effect which culminates in an almost explosive production of lactic acid during heat rigor, which occurs, in such an animal as the frog, at about 35·5° C. When a muscle is initially fatigued and then left in oxygen, its lactic acid concentration continually falls over a period of hours—that is, the recovery process—and the muscle becomes as capable as before of reacting to a stimulus. In such a case—regarded from the standpoint of the intact animal—the oxygen supply is grossly inadequate, owing to the slowness of its diffusion through the muscle substance from outside. The recovery process, in the presence of an adequate supply of oxygen, as in man after moderate exercise, or in the isolated muscle after a single twitch, is far more rapid. This abolition of lactic acid during the recovery process does not appear to diminish the total amount of it which can be obtained later from the same muscle by stimulation, by mechanical injury, or by heat rigor; either it is not oxidised but rather restored to some previous position in the chemical architecture of the muscle, or there is some limit to the lactic acid concentration set by its own presence there, for example, by the rise in hydrogen-ion concentration which it causes. We shall see later that both explanations are essentially true.

These experiments of Fletcher and Hopkins, which have been fully and widely confirmed since by Meyerhof and others, were obviously of fundamental importance in the study of muscle. They were the starting-point of the investigation which Prof. Langley proposed to me in 1909, as they were the basis of Meyerhof's recent work. They clearly opened up all kinds of problems—what happened to the lactic acid when it was removed in recovery? How long did the process take when the oxygen supply was adequate? Was the lactic acid the essential link in the chain of muscular contraction, or only a by-product to be got rid of as soon as possible? Many of these questions have since been answered, largely by the aid of experiments on the heat production of muscles under various circumstances.

HEAT PRODUCTION OF MUSCLES.

There is a special advantage in studying the heat production of muscles; this will be obvious to any who, in these mechanical days, like to regard the muscle as a machine. The first and most important factor in a machine is the amount of energy which it uses. A much more important advantage, however, in studying muscle is the fact that *heat* measurements can be made without injuring the tissue, continuously while the processes inside it are going on. To study the *chemical* changes in a muscle requires us to destroy it each time we make an observation. The sensitivity, moreover, of the thermo-electric method, applied to measurements of heat in muscle, is so great that it is possible to examine, during and after a single twitch, the processes which can be studied by chemical methods only after severe activity.

RIGOR MORTIS.

We have learnt a great deal in this connexion from the study of rigor mortis. When a frog's muscle is warmed to 35° C. or more it goes rapidly into rigor, the only chemical process known to accompany this condition being the production of lactic acid—as Fletcher and Hopkins showed—followed by the effect of the acid in producing stiffness or coagulation of the muscle substance. The heat liberated during rigor is one to two calories per gramme of muscle. Seeing that no chemical processes are known to accompany rigor except the lactic acid production, it was natural to attribute this liberation of heat to the unknown process by which the lactic acid also is liberated. This rigor heat is considerably reduced by previous injury, by prolonged anaerobic survival, or by stimulation. The same heat may be liberated in rigor produced by chloroform; it also is reduced by survival without oxygen and by fatigue. Its level is restored by oxygen after fatigue, and maintained at a high level during resting survival in the presence of oxygen. The heat liberated per gramme of lactic acid was estimated roughly in 1912 as being about 370 calories. Recent and much more accurate measurements by Meyerhof have confirmed this value. Peters, in 1913, found that the heat liberated during stimulation to complete fatigue is about 0·9 calories per gramme. The heat liberated in subsequent rigor is about 0·87 calories. Rigor in the unstimulated muscle gave about 1·7 calories. Stimulation of fresh muscles leads to the liberation of about 0·2 per cent. lactic acid; rigor to one of about 0·4 per cent.; stimulation followed by rigor also to about 0·4 per cent. Hence it is obvious that lactic acid and heat formation run parallel to one another, and that rigor and anaerobic activity involve the same chemical change—namely, the production of lactic acid from some precursor with the liberation of about 370 calories for every gramme of acid set free.

ORIGIN OF LACTIC ACID.

This determination of the heat production associated with the formation of 1 g. of lactic acid, either in rigor or in the anaerobic activity of muscle, enables us to decide with fair certainty what are the chemical reactions associated with contraction, and from what substance the lactic acid arises. Now, it is probable on other grounds that glycogen is the precursor of lactic acid. The heat of combustion of dissolved glycogen $(C_6H_{12}O_6)n$ has been determined by Slater as 3836 calories, that of lactic acid ($C_3H_6O_3$) by Meyerhof as 3601 calories per gramme; the formation, therefore, of lactic acid from glycogen is accompanied by the liberation of 235 calories per gramme. Now, as we shall see shortly, this lactic acid never occurs as such to any appreciable degree inside a muscle; it is always there neutralised in the form of sodium or potassium lactate. There are grounds for believing that the neutralisation takes place at the expense of a sodium protein salt, the alkali protein substance of the muscle itself. According to Meyerhof the heat of this neutralisation is 135 calories, so that the total heat associated with the formation of lactic acid from glycogen and its subsequent neutralisation would be 370 calories. This is precisely the amount of heat set free when 1 g. of lactic acid is formed inside a muscle during activity or rigor. It is obvious, therefore, that in the initial process of contraction and relaxation—i.e., apart from recovery—no chemical change of any importance occurs except the formation of lactic acid at the expense of glycogen and its subsequent neutralisation. There may be small, and from the energy standpoint unimportant, side reactions, but it is a great simplification to know that the fundamental chemical process underlying a contraction is simply the formation of lactic acid from glycogen.

That glycogen is, indeed, the precursor of lactic acid in the muscle is shown by the direct determinations of Meyerhof, which have been confirmed in Hopkins's laboratory. During anaerobic activity, or survival, glycogen disappears from the muscle and lactic acid appears in exactly equivalent amount; CO_2 is driven out by the lactic acid from the bicarbonate present in the muscle; heat is liberated proportional to the lactic acid. No change, however, is observed in the fat, and the lactic acid maxima are, in exercise 0·25 to 0·4 per cent., in rigor 0·4 to

0·7 per cent. The reaction is apparently a self-inhibited one; it is stopped by the rise of hydrogen-ion concentration produced by the lactic acid and may be caused to go further by the presence around the muscle of alkali and phosphates. Presumably the complete failure to contract, produced by muscular fatigue, is due to the same cause.

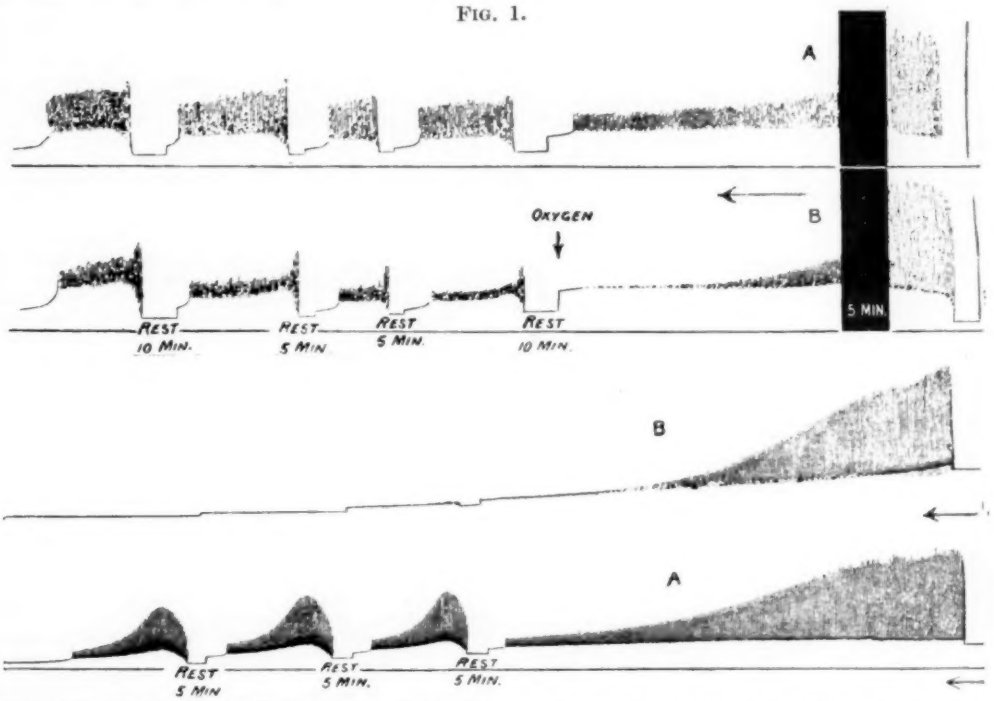
BUFFERS IN MUSCLE.

The accommodation in the muscle of these enormous quantities of lactic acid requires some special consideration. It has been stated that during activity a muscle becomes acid; so it does, but only very slightly. Were the acid free inside it the hydrogen-ion concentration would rise thousands of times as the result of a few contractions. Ritchie in 1922 showed, by an electro-metric method, that no appreciable change in the hydrogen-ion concentration of a muscle occurs after several seconds tetanus; the acid, therefore, is neutralised. In blood we know that there are various alkaline buffers—bicarbonate, phosphate, and particularly the sodium or potassium salt of hæmoglobin. These react with an added acid, forming a neutral salt and the undissolved buffer acid. So it is in muscle. The total amount, however, of bicarbonate and phosphate is insufficient to neutralise all the acid formed in exercise, and it has been shown by Meyerhof that the main part of the neutralisation occurs as the result of combination of the acid with the sodium protein salt of the muscle tissue itself. The amount and efficiency of this buffer constituent of the muscle are the chief factors enabling the muscle to stand high concentrations of acid—that is, to tolerate a high degree of activity.

MYOTHERMIC EXPERIMENTS.

I will pass on now to describe the experiments, made by means of the thermo-electric method on the isolated muscle, which have enabled us to describe the time course of the events which happen during and after muscular activity. The thermo-electric method is a highly sensitive one; it is possible—if one desires—to obtain deflections of more than a kilometre for one degree centigrade! Such a sensitivity indeed is not wanted, since the rise of temperature in a muscle twitch is of the order of 3/1000th of a degree; it is necessary merely to read to the nearest 100,000th of a degree to obtain all the sensitivity required for such observations. It is essential to keep the muscle in its chamber far removed from any external temperature disturbances; this is done by sinking it under water maintained at a constant temperature in a large double-walled vacuum flask. Connected to a sensitive galvanometer the thermopile registers its changes of temperature on a revolving drum carrying photographic paper. When the muscle is stimulated its temperature rises and the galvanometer deflects, the moment of stimulus being recorded on the record. The deflection reaches a maximum comparatively slowly, owing to lag in conduction of heat into the thermopile and inertia of the galvanometer system. It then moves slowly back towards its original zero, owing to gradual equalisation of temperature along the thermopile and loss of heat by conduction to outside. The curves by themselves do not tell us much about the time course, or the absolute magnitude, of the liberation of heat; it is necessary to make a "control" experiment. A known amount of electrical energy, carefully measured, is liberated inside the same muscle after it is dead, in the same position on the thermopile, and the resulting rise of temperature is registered. The comparison of the maximum in the control heating, with the maximum when the muscle produces its rise of temperature by its own physiological activity, gives us in absolute units the heat production in the latter case. The comparison of the forms of the curves enables us, by a somewhat laborious numerical technique, to analyse the production of heat in the live muscle, as a function of the time. I say laborious: may I take this opportunity of emphasising how the results which I am just describing are mainly due to the skill and patience of my colleague, W. Hartree. Without him it would never have

FIG. 1.



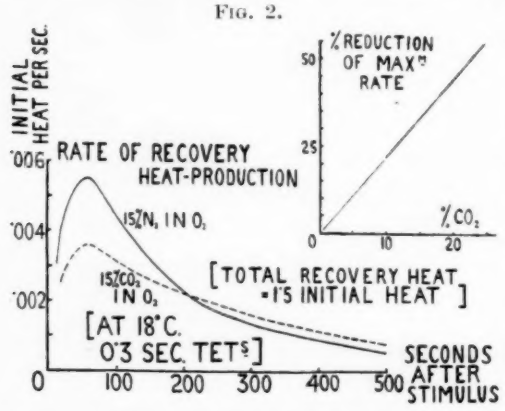
The upper two tracings show fatigue of pair of gastrocnemii, (A) in oxygen, (B) initially in nitrogen 19° C. Max. break shocks every second. Note "steady state." The lower two show fatigue of pair of sartorii, (A) in oxygen, (F) in nitrogen. (Fletcher, 1902.)

been possible to do more than a fraction of what I am describing in these lectures. This work is really his and not mine, which gives me the better excuse and makes it the greater pleasure to be able to present it to you.

THE RECOVERY HEAT PRODUCTION.

In the analysis of the heat production of the live muscle the first result we obtain is that a large amount of heat is liberated directly the contraction begins; then there is a pause, and again there is a liberation of heat during relaxation. It is natural to associate the first production of heat with the formation of lactic acid from glycogen, the second production of heat with the neutralisation of the lactic acid. It is soon found, however, that the heat production is not finished when the muscle has relaxed; the deflection of the galvanometer when the muscle is in oxygen returns only slowly to zero, far more slowly than in a dead muscle warmed suddenly at the beginning. This can be due in the live muscle only to a continual formation of heat for long periods after the contraction is over, this heat maintaining the temperature of the thermopile and the deflection of the galvanometer. This recovery heat production, as it is called, goes on for 10 to 20 minutes at room temperature (Fig. 2); at 0° it may

FIG. 2.



be apparent nearly an hour after the stimulus. It is clearly concerned with the oxidative removal of lactic acid, which was found by Fletcher and Hopkins to occur in oxygen after activity. It is not affected, however, by diffusion, since the muscle contains, dissolved in its own substance, more than enough oxygen to account for the small amount of heat actually liberated in recovery from a single contraction. We do not know in detail what the events are which occur during this restoration process. The curve, however, of the recovery heat production represents the thermodynamic outline into which must be fitted the picture of the recovery process as a whole, which will be painted in the future by the biochemists.

Factors Affecting the Speed of Recovery.

It is noticeable that the rate of the recovery process increases, not only absolutely but relatively, when the extent of the initial breakdown is greater. Recovery appears to be determined by some kind of bi-molecular reaction. The presence of lactic acid in the muscle is a sensitive "governor" of oxidation; the speed of the latter increases as the square of the concentration of the former. This may not seem in itself of great practical account; we shall see, however, in the next lecture how large a determining factor it is in the degree of fatigue resulting from a given amount of muscular exercise.

The recovery heat production is affected by a variety of factors. A rise in hydrogen-ion concentration (see Fig. 2) diminishes its rate, while leaving its total magnitude unaltered. A large decrease in the rate of recovery may be produced by a comparatively small rise in the hydrogen-ion concentration inside the muscle fibre. This is analogous to the effect produced by hydrogen-ion concentration on the rate of autoxidation of cystein or glutathione, or, according to a private communication from Prof. Meyerhof, of the oxidation of fructose in the presence of phosphates. The rate of recovery is increased by a rise of temperature; it is diminished by soaking the muscle for some time in Ringer's solution—possibly the soaking of the muscle removes some oxidising catalyst analogous to Hopkins's glutathione.

Chemical Events in Recovery.

I said that the curves of the recovery heat production represent the thermodynamic outlines of the future chemical picture. Fortunately, some details of that chemical picture are already known and fit well into the outline. In a muscle kept in oxygen no lactic acid ever appears; lactic acid already formed disappears; oxygen is used and carbon dioxide is produced in excess of the resting values. The excess CO_2 is equal to the excess oxygen—i.e., the R.Q. of recovery is unity. The restoration process, therefore, in the isolated muscle (probably not in the intact animal) involves the oxidation of something with the general formula of carbohydrate. There is no sign of change in the fat inside the muscle; heat, as we have seen, is liberated, and—most important of all—*glycogen has been shown by Meyerhof to be re-formed.*

From the oxygen used and the CO_2 produced we may calculate the carbohydrate oxidised. The amount of glycogen re-formed, plus this amount of carbohydrate oxidised, is shown experimentally to be exactly equal to the amount of lactic acid which has disappeared. It would seem, therefore, that the lactic acid is mainly or entirely re-formed into glycogen during recovery, but that a certain amount of energy (obtained from the oxidation, either of a part of the lactic acid, or of carbohydrate) is necessary in order to force the reaction backwards. The matter is best discussed from the purely energetic standpoint.

In the anaerobic process of activity—the process producing fatigue—glycogen becomes sodium lactate with the evolution of 370 calories per gramme of lactic acid. In the recovery process the reaction is reversed, sodium lactate becomes glycogen, and 370 calories therefore of energy must be absorbed. This in itself would lead to a cooling of the muscle. Actually Hartree and I have found that in the process of "recovery" there is an extra oxidative heat production almost exactly equal to the total anaerobic heat production of the previous process of "fatigue." The total recovery heat, therefore, is 370 calories, so that the total energy liberated in recovery is 740 calories. The heat of combustion, however, of dissolved glycogen is 3836 calories. Hence, in the complete cycle by which 1 g. of glycogen becomes 1 g. of lactic acid and then is restored from the acid, the fraction $740/3836 = 0{\cdot}193$ g. of glycogen must be oxidised to provide the necessary energy. The initial process of contraction is forced backwards by the energy liberated in this oxidation. This reversal is the recovery process.

"Efficiency" of Recovery.

The ratio of the lactic acid removed during recovery to the lactic acid, or carbohydrate, oxidised to provide the necessary energy for its removal, may be called the "efficiency of recovery"; it appears to be about 5·2 : 1—five to six molecules are removed for every one oxidised. Direct chemical measurements by Meyerhof of the glycogen and lactic acid showed that the efficiency of recovery is about 3 or 4 : 1. In these experiments, however, owing to the slowness of oxygen-supply by diffusion, the process was a very prolonged one and involved considerable oxygen-want; the efficiency of recovery may well have been less. It has proved possible on man to make similar observations of the efficiency of recovery; they have led to values similar to that obtained on isolated muscle. These values are perhaps the best reward we have had for the faith that nature is consistent. I will discuss them more fully in my next lecture.

THE ADRENALIN TREATMENT OF STOKES-ADAMS ATTACKS.

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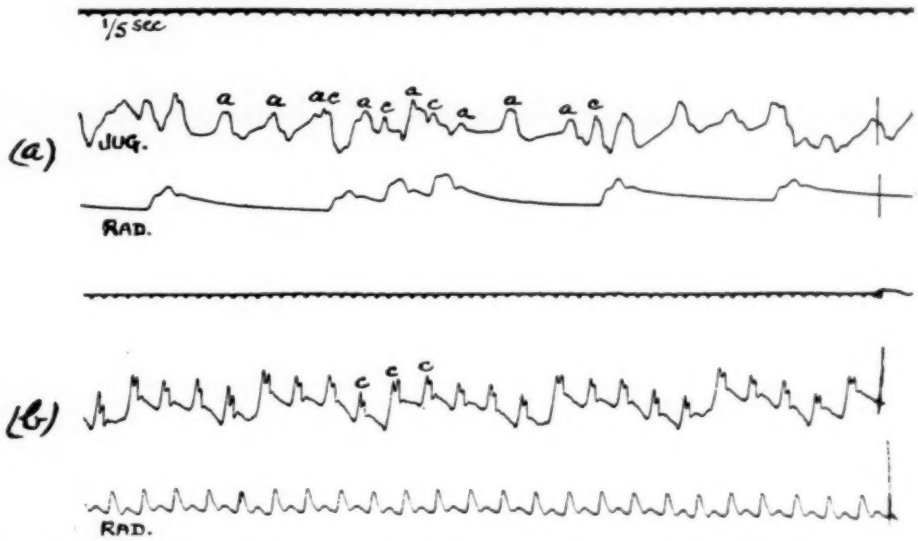
THE possibility of using adrenalin in the treatment of Stokes-Adams attacks has been raised by pharmacological evidence of its power to increase the auricular and ventricular rate independently and even to reduce auricular-ventricular block. Phear and Parkinson [1] have discussed this evidence in reporting its successful clinical application in a patient with complete heart-block who had been undergoing attacks almost incessantly for a week. These were abolished within 15 minutes by a subcutaneous injection of adrenalin, 5 minims (0·3 c.cm.) of a 1 : 1000 solution. Atropine, previously tried, had failed to influence the attacks. In the following year Feil[2] reported his observations on a man of 50 with complete heart-block and frequent syncopal attacks. After atropine had failed, a subcutaneous injection of adrenalin, 10 minims (0·6 c.cm.) of a 1 : 1000 solution, immediately stopped the attacks. When they recurred 12 hours later, and again 24 hours later, they were on each occasion stopped by a similar injection. The effect produced in both these cases seems to have been simply to abolish the periods of ventricular standstill, for at the time no change in ventricular rate occurred.

We have recently had an opportunity of repeating this method in the case of a man admitted to the National Hospital for Diseases of the Heart under the care of Dr. Strickland Goodall, who very kindly placed him at our disposal for this purpose.

A man of 44, a cook, was admitted to hospital at 7 P.M. on Feb. 22nd, 1924, with a history of good health until the previous day, when at 9 A.M. and again at 11 A.M. he noticed for a few seconds a mist in front of his eyes. At 1 P.M., while serving dinners, he lost consciousness and fell. He was picked up having recovered consciousness, and went on working. At 2 P.M. he had a similar attack in which he bruised his head, and at 2.10 P.M. he had a third. He went home to bed and there had three more attacks. He passed a good night but woke with throbbing pains in the head followed by several attacks. From that time there were no more till after admission.

There was no history of acute rheumatism, chorea, syphilis, nor of any other infection; and the Wassermann reaction was negative. He was of good physique, in no distress, but rather looked well. There was no cyanosis, no pallor, no dyspnœa, and he could lie flat in bed. The apex-beat was in the fifth space in the nipple line. The sounds were normal, though there were intermissions about to be described. The arteries were palpable and slightly tortuous. The systolic blood pressure was 140 mm. Hg and the diastolic 75. X ray inspection revealed slight enlargement of the heart to the left and the apex-beat in the nipple line; this was confirmed by orthodiagram. Polygrams showed a normal A-V sequence at the rate of 73 with frequent extrasystoles and from time to time ventricular pauses lasting up to six seconds. These were perceived by the patient but did not inconvenience him.

FIG. 1.



Polygrams: (*a*) Before adrenalin; severe heart-block with a ventricular rate of 28, except for occasional A-V :: 1 : 1 beats. (*b*) Twelve minutes after a subcutaneous injection of adrenalin (℞ x.); rate 110.

Course.

During the next three weeks the patient passed through three phases in respect of cardiac conduction. The first was that of a rapidly increasing heart-block which became complete after 30 hours. During the next 12 days the dissociation remained complete (second phase). The third phase, lasting eight days, was ushered in by a striking increase in the number of syncopal attacks, and characterised by a gradual recession of the block ending in the spontaneous resumption of normal rhythm.

First Phase.—During the night he had several syncopal attacks in which he grunted, flushed, turned his head sharply to one side, and remained unconscious for a moment. Immediately after one of them a continuous polygram showed an auricular rate of 100 per minute and a ventricular rate of 28 per minute, except for occasional runs of two to five normal beats (1 : 1 rhythm). (Fig. 1.) Five minutes after a subcutaneous injection of 10 minims (0·6 c.cm.) of adrenalin (1 : 1000 solution) the runs of normal beats had become longer and more frequent, and 12 minutes after the injections the whole record was regular at the rate of 110 (Fig. 1). Owing, perhaps, to the more violent carotid pulsations induced by adrenalin, "a" waves cannot be identified on this tracing; but an electrocardiogram taken later under similar circumstances showed

[1] Phear, Arthur G., and Parkinson, John: THE LANCET, 1922, i., 933–936.
[2] Feil, Harold: Jour. Amer. Med. Assoc., 1923, lxxx., 26–28.

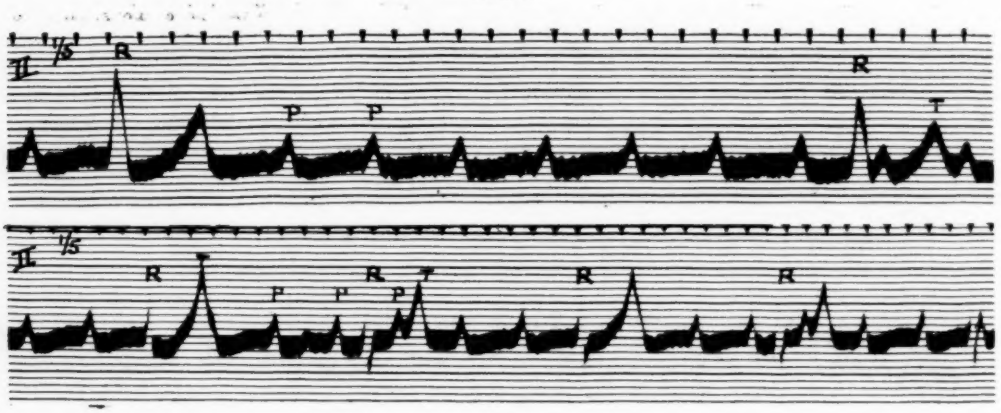
the presence of 1:1 A-V sequence (Fig. 3). Twenty-five minutes after the injection the rate had risen to 120 a minute, which proved to be the maximum. Three hours later the pulse was 75 and regular; but in another hour it had returned to the slow and irregular condition present before the injection, and a syncopal attack occurred. Next morning he had several short attacks, the period of ventricular standstill in one recorded instance measuring 17 seconds. Between the attacks the ventricular rate was 15 a minute, and the same short runs of normal rhythm (or rather 1:1 rhythm) were still seen. Adrenalin ℞x. was again given with the same result. A continuous polygram showed that within five minutes the ventricular rate had doubled; within 15 minutes the rate was 108 and the rhythm appeared to be normal; in 25 minutes the maximum of 118 was reached. Four hours later the rate had dropped to 32, and polygrams and electrocardiograms showed that complete block was present. It will be noted that after both injections the attacks completely disappeared for some hours.

Second Phase.—During the next 12 days dissociation remained complete, though the ventricular rate varied within wide limits, the lowest recorded being 12 per minute (Fig. 2) and the highest 60. Syncopal attacks occurred irregularly, the patient enjoying complete freedom for one period of four days. No relationship could be traced between the changes in ventricular rate during complete block and the liability to syncopal attacks. Adrenalin was given on five occasions. It invariably abolished the attacks for some hours, but it never caused any reduction in the block when this was complete. The ventricular rate was increased to about 60 a minute, but never higher, while that of the auricle rose to 115. Thus a slow initial ventricular rate was considerably accelerated, while on one occasion when the rate was 60 before the drug was given, it was unaffected. The patient by this time had come to regard adrenalin as a specific for his attacks and begged for its regular administration to anticipate and prevent recurrence. It was thought better, however, to reserve it for occasions when the attacks were frequent.

Third Phase.—Fourteen days after admission there was a sudden increase in the frequency of the attacks so that 100 were charted in a single night. The attacks were all of the same type but of variable duration. The patient became pale and the pulse stopped; he then lost consciousness and the breathing became stertorous; then in the longer attacks he was convulsed for a few moments (see Fig. 4). It will be noted that before and after the attack there is present a varying but always incomplete block with some A-V 1:1 beats. Before adrenalin was given on this occasion attacks had been recurring almost every minute for an hour. A continuous polygram showed an attack at the moment of injection, another one minute after, and then no more. The rate rose to 120 in 20 minutes, apparently with 1:1 rhythm as in phase 1. After two hours' freedom the attacks recommenced and 80 were charted during the next 12 hours. Adrenalin was then repeated and he slept undisturbed for six hours. Again the attacks recurred, and this time adrenalin was given promptly, preventing further attacks as expected. During the rapid rate which in this phase always followed the injection, an electrocardiogram was taken (Fig 3). It will be seen that normal A-V sequence is present, with a slightly prolonged P-R interval.

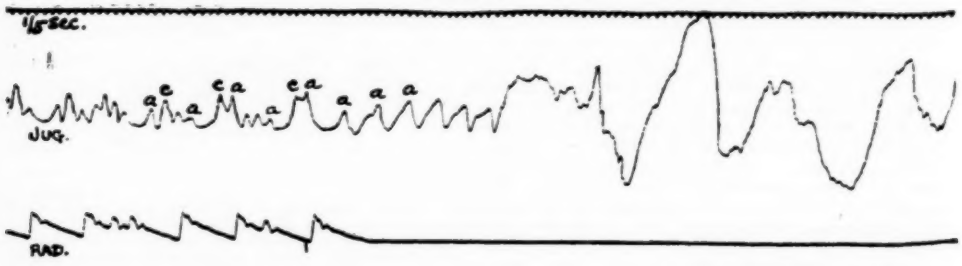
Two days later the attacks ceased altogether, and in three more days it was found that the heart had spontaneously reverted to normal rhythm. During the next five weeks he remained free from attacks and felt well, and

FIG. 2.



Electrocardiograms: (*a*) Before adrenalin; complete heart-block, P = auricular systole, R–T = ventricular systole; auricular rate 110, ventricular rate 12 a minute. (*b*) Ten minutes after a subcutaneous injection of adrenalin, ℞x. (0·6 c.cm.); complete heart-block; auricle 112, ventricle 33.

FIG. 4.



Continued on opposite page.

Polygram showing the whole of a Stokes-Adams attack. *a* = auricular wave; *c* = carotid wave. After a short period of partial heart-block there is ventricular standstill for 18 seconds. Convulsive movements are indicated towards the end of the record, following stertorous breathing.

electrocardiograms now always showed a normal rhythm. He remains well six weeks after discharge from hospital.

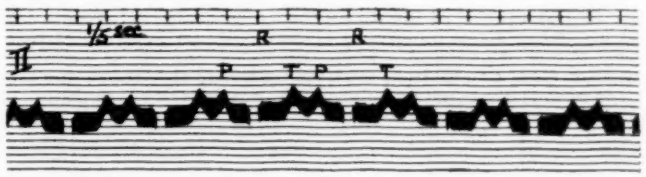
Discussion.

In their review of the literature, Phear and Parkinson came to the conclusion that there was sufficient evidence to show that partial heart-block may be reduced and even complete block abolished by the injection of adrenalin, while an increase in ventricular rate is usually obtainable. In their patient, as in Feil's, after the failure of atropine, adrenalin stopped the attacks; but the complete block present in both cases was unaffected and the rate was not increased at the time.

In the case here described, there appears to have been an acute lesion of the myocardium involving the auriculo-ventricular bundle, with a rapid onset of heart-block, and a period of complete dissociation followed by a more gradual recovery of conduction. Stokes-Adams attacks occurred in all three phases, but much the greater number took place during recovery of conduction. Opportunity was therefore afforded for studying the action of adrenalin both when the block was partial and when it was complete. On the 12 occasions on which it was used, with one doubtful exception, it abolished the attacks within three minutes; and freedom from attacks was maintained from 2 to 48 hours from the time of injection. On four recorded occasions when partial block was present, the auricular and ventricular rates both increased to 120 and normal auriculo-ventricular sequence was restored. When complete block was present and the ventricular rate was slow, this was increased to about 60, but the block remained complete. On one occasion, when the ventricular rate was already 60 before the injection, no increase in rate took place.

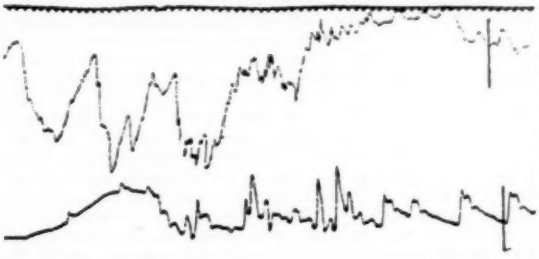
It must not be expected that adrenalin will succeed in every case showing Stokes-Adams attacks. We have seen two cases where the clinical effect of adrenalin was disappointing. 1. In a man of 72 with complete heart-block convulsive attacks were occurring at least every hour, two being observed in the 20 minutes preceding the injection of adrenalin ℥v. (0·3 c.cm.) On this occasion no more occurred for two hours, yet on the following day more severe attacks were uninfluenced by ℥x. (0·6 c.cm.) and the patient died in an attack, though ℥xv. (0·9 c.cm.) had been injected subcutaneously ten minutes before. 2. In a man of 70 with complete heart-block and syncopal attacks recurring several times daily, adrenalin ℥v. failed to affect either the auricular or ventricular rates (A-V :: 90 : 25) and an attack occurred 35 minutes after the injection.

FIG. 3.



Electrocardiogram taken during the rapid heart action following adrenalin. P = auricular systole; R–T = ventricular systole. The P–R interval is slightly over one-fifth sec.; 1 : 1 rhythm is shown, at a rate of 100 a minute.

FIG. 4—(*Continued.*)



The usual treatment of Stokes-Adams attacks in respect of drugs is the subcutaneous injection of atropine. This treatment is largely based upon the fact that where partial heart-block is present atropine by its action on the vagus may facilitate conduction and, in so far, may increase the ventricular rate. Where the heart-block is complete, it is not capable of increasing the rate of the ventricle. Whatever the block, it is only where the attacks depend upon strong vagal influence—a rare event—that atropine might be expected to succeed. Clinical experience confirms this and shows that it is most uncommon for atropine to control attacks.

On pharmacological grounds adrenalin might be expected to have a wider application than atropine in the treatment of Stokes-Adams attacks. It can facilitate conduction when partial block is present. What is more important is that it can directly increase the rate of a dissociated ventricle. Further, it has now been shown clinically that, even if the block is uninfluenced and the ventricular rate is not increased, adrenalin can abolish the recurrent standstill of the ventricle which under these conditions determines the syncope.

We are of opinion that the subcutaneous injection of adrenalin, 5–10 minims (0·3–0·6 c.cm.) of the 1 : 1000 solution, is the most promising method of treating Stokes-Adams attacks, and should therefore be tried in every case.

MENTAL DEFECT AND MENTAL DEGENERACY IN A RURAL AREA.

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THIS paper is based upon information obtained in the ascertainment of mental defectives among school children in a rural area during a period of two and a half years, beginning in January, 1921. It is laid down in the Mental Deficiency Act of 1913 that it is the duty of a local education authority to ascertain the number of mentally defective children in the school population; but where, as in most rural districts, no special schools are available for mentally defective children, this Act has for the most part been a dead letter. Hence, mainly, the very varied nature of the figures quoted as to the number of mental defectives in rural areas. It is hoped that the present paper, based upon information as complete as possible under existing conditions, will serve as a contribution to knowledge of the problem of mental defect as it exists in rural areas.

Method of Ascertainment.

As the routine medical inspection of the children in the area under investigation is done by me, I have examined the greater proportion at some time or another. Opportunities occur during a routine inspection of noting children who require special examination for mental defect. Such points as an obviously abnormal manner and appearance, or an unduly low school standard for the age, may serve as indications for special examination. But it must not be supposed that more than a minority of mental defectives can be picked out by such indications. The greatest reliance has to be placed on the teacher in bringing forward suspected cases, or those who are exceptionally backward. But I have been struck

by the fact that in many instances teachers have failed to recognise even cases well below the borderline of mental defect as feeble-minded, cases which would therefore have escaped notice had their recognition depended entirely on the teacher. In the present area and probably in other areas also—though I have no experience of them—a large proportion of teachers regard mental defect or a congenital low level of intelligence as the *last* cause to be thought of in explaining cases of failure to make normal progress. They tend to assume that bad home conditions, frequent migrations, too large families, are the actual causes of retardation of intelligence, whereas these conditions are often themselves the evidence of, and the result of, a low level of hereditary intelligence in the family. Moreover, children who are very much retarded in intelligence are frequently found advanced a standard or two above that which is really suited to their mental age, though still in a standard below that appropriate to their chronological age.

It is, however, not surprising that many teachers should fail to realise the all-importance of innate or hereditary qualities, and lay undue stress on environment, for the greater part of our educational system is built upon the assumption that all children, with only trifling exceptions, are essentially equal in innate intelligence, that is, in their capacity to receive and profit by an education substantially the same for all. I think it probable, therefore, that the figures I have obtained are far from representing the total. In order to be certain that they are complete, it would be necessary either to subject all children to some form of group test, which would clearly indicate those falling below a certain level of intelligence, and, therefore, requiring individual examination; or that teachers generally should have a more adequate knowledge in the matter of mental defect, so as to be better able to select those children who should be specially examined.

The method of special examination referred to consists of a physical examination, a mental examination, an inquiry into the educational progress, the conduct, temperamental conditions, and social relations of the child, and an inquiry into the family history, including in most cases a visit to the home of the child.

The examination by means of intelligence tests forms a very important part of the investigation. In the present series the Stanford revision of the Binet-Simon tests was used in all cases. For those who are unfamiliar with them a few words on the general principles of these tests may not be out of place. They depend on the fact that native intelligence—or the capacity for making mental acquirements as distinct from the acquirements themselves—develops gradually from birth up to the age of about 16. In bright children the intelligence develops at a quicker rate and reaches a higher level than in average children; while in dull children the reverse is the case. The tests themselves consist of a number of questions, problems, and the like, graded in difficulty, and with a definite standard of success or failure. From the number of successes in these tests it is possible to calculate the mental age of a child, as distinct from his chronological age. In a bright child the mental age will be above the chronological age; in a dull child it will be below. In a strictly average child the two ages will, of course, correspond. The ratio between the mental and the chronological age, the latter being taken as 100, gives a measure of the intelligence of the child, and is known as the intelligence quotient, or shortly as the I.Q. This I.Q., being a measure of native intelligence, is little influenced by ordinary variations of environment or education, and tends to remain constant through all ages. Average intelligence is indicated by I.Q.'s of 90 to 110; superior intelligence by I.Q.'s above 110; and very superior intelligence by I.Q.'s above 120. I.Q.'s of 80 to 90 rank as dull normal; I.Q.'s of 70 to 80 as bordering on mental defect; while I.Q.'s below 70 indicate definite mental defect.

There are factors other than the I.Q. which have to be taken into account in forming a final opinion as to mental defect. It may, for example, be necessary owing to definite abnormalities in conduct or temperament, to regard some cases with I.Q.'s between 70 and 80 as feeble-minded. In the present investigation all cases with an I.Q. below 70 have, with very few exceptions, been classified as feeble-minded, or if below 50 as imbecile. Some cases with an I.Q. between 70 and 80 have been regarded as feeble-minded on the strength of other abnormalities in the mental make-up. I feel that in this latter group more cases should have been regarded as feeble-minded than were actually so classified, and that in these cases abnormalities of conduct will show later that they really belong to the feeble-minded group. As indicated above, an I.Q. of 50 has been taken as the dividing line between the feeble-minded and the imbecile groups. The I.Q. is, of course, no guide in the diagnosis of moral imbecility, except in so far as a moral imbecile is by definition distinct from a feeble-minded person or an imbecile. In some low-grade cases also anything like an intelligence test is clearly quite out of the question. It is possible that, when adults are considered, the above-mentioned limits for the I.Q. are not strictly accurate, but as in the present investigation only children were examined by this method, any difficulty here need not concern us.

Before concluding these remarks on diagnosis I should like to emphasise the fact that, in order to obtain a satisfactory picture of a child specially examined, it is necessary to take into consideration not only the I.Q. but also facts from all available sources as to the behaviour of the child in relation to its environment, the nature of that environment, and the type of family of which the child is a member.

Statistical Results.

The total number of school children which came under review was 4979. This number was contained in a continuous area comprising part of the county of Wiltshire. A municipal borough, which is situated in the area, but which is educationally autonomous, was not included; nor was a similarly situated urban district with a population of 5500, the schools in which I have only recently taken over. The girls' and infants' schools of a second urban district with a population of 2000 were also excluded, as they are not inspected by me. With the exception of the boys' school in the last-named district, which has a number of about 110 on the roll, all the remaining schools are included in five rural districts with a total area of 373 square miles, and a total population of all ages of 36,243 in 1921. The area concerned is therefore very sparsely populated, and consists of scattered villages, in which the predominant occupations are agricultural.

The total number of mental defectives of all grades ascertained was 168. Of this number 140, or 83 per cent., have been classified as feeble-minded, and 27, or 16 per cent., as imbeciles, the remaining one being a moral imbecile. Some of the imbecile group have never attended school, and an additional number have been excluded from further attendance. (I have taken no account of a small number of idiots seen from time to time, as such low-grade cases do not always come under my cognisance.) For the reasons stated above it is probable that the number of feeble-minded children ascertained falls short by a good deal of the number that have been actually present during the time under review. I am inclined to think that the numbers found should be increased by anything up to 50 per cent., or even more, in order to obtain the actual numbers that have been present.

This opinion is confirmed by the diagram (to which attention will be called below) showing the distribution of the I.Q.'s of the cases examined and classified as mentally defective. Each rectangle represents the number of cases the I.Q.'s of which fall within limits of five points. It will be seen that in the diagram the highest rectangle corresponds with the group 60 to 64, while that corresponding with the

group 65 to 69 is lower. According to the curve of normal distribution, which has been found to be approximately followed, when large numbers of unselected children have been examined, the rectangles should be increasing steeply in height at this point. In the present diagram some part of the irregularity may be due to the comparatively small numbers examined, but part is almost certainly due to the fact that the higher-grade cases are more frequently missed owing to reasons given above, and therefore not included. (This argument is, of course, valid only for I.Q.'s below 70, above which point only a small proportion of those cases actually examined has been included in the diagram, the remainder not having been classified as feeble-minded.) It is probable also that the number of imbeciles is not complete, as the lower grades are not usually sent to school, and their existence is sometimes not known.

In order to obtain an accurate idea of the number of defectives present at any one time in the total school population, certain corrections must be applied to the figures as actually found. Very few defectives are examined by me before they reach the age of 7, and of this small number all but one have now reached that age. Not the total school population, therefore, but that part only which has attained the age of 7 should be taken as the basis of comparison. This number should be brought into relation with the number of defectives between the same ages. Those defectives, therefore, who have now attained the age of 14, the present school-leaving age, must be subtracted from the total number, as well as those defectives who have left the district between the time of examination and the time of writing. As the schools are visited at least every six months, and most defectives are kept under supervision by the Voluntary Association for Mental Welfare, this last number may be taken as accurately known. The corrected figures may be given in tabular form thus :—

Total school population between ages of 7 and 14	3868
Mentally defective children between the same ages at present in district*	116
Imbeciles included in above	19
Feeble-minded included in above	96
Percentage of imbeciles	0·5
Percentage of feeble-minded	2·5
Percentage of all grades of mentally defective	3·0

* Including one moral imbecile.

Those children who have been sent by the local authority to institutions outside the area are included.

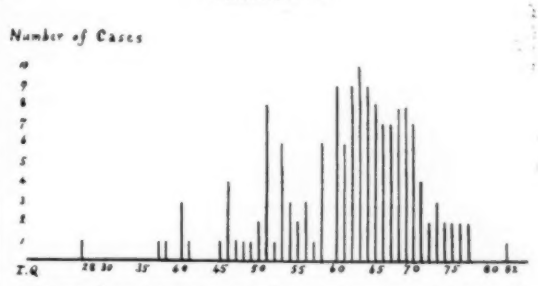
We find, therefore, that there are 3 per cent. of ascertained mental defectives of all grades among children who would ordinarily attend public elementary schools. These figures are as accurate as it is possible under existing conditions to make them. If we are correct in thinking that the percentage ascertained falls considerably short of the real number present, we shall perhaps not be far from the mark in assuming that the true percentage of defectives of all grades lies somewhere in the neighbourhood of 4, or perhaps higher. But, even if one assumes that the lower figures are correct, they are much above those given for towns which have been adequately investigated. Burt, for example, taking an I.Q. of 70 on his own scale as the dividing line, finds that in London 1·5 per cent. of all children (not including in this number the imbeciles) fall below this line and are eligible for special schools. The corresponding figure in the present investigation is 2·5 per cent. The causes of the greater prevalence of mental defect in rural districts will be indicated later.

Distribution of Intelligence among Defective Children.

We may next consider the distribution of intelligence among children ascertained to be defective, and this is best shown by diagrams. The I.Q. was, apart from one or two exceptions to be noted, in all cases carefully taken by myself in accordance with the directions given in Terman's book on the "Measurement of Intelligence." In the majority of cases the longer series of tests was used, in the minority the shorter series of the starred tests only. In these cases the I.Q. may be relied upon as being as exact as careful testing combined with experience in giving the tests can make it. In rather less than half (13 out of 27) of the imbecile group, that is, those whose I.Q.'s fall below 50, the I.Q. was not taken, owing to the fact that it was not possible to test the children, the cause being generally too low a level of intelligence, though in some cases temperamental conditions formed the obstacle. In only one case was there a failure to get the I.Q. in the feeble-minded group owing to the extreme difficulty in securing responses. This was in a girl of nearly 14. I have put her I.Q. as 50 for the purpose of the diagram, but this must be regarded as largely a guess from general considerations. Two other cases were also classified as feeble-minded, which were not examined in sufficient detail to make even a guess at the I.Q. possible. In a few cases the same child was retested after an interval, perhaps two years or more, generally with the result that there was an insignificant difference in the I.Q. In these cases the first result only has been used for the purpose of the diagrams. The detailed distribution of the I.Q.'s is shown in Diagram 1, where all grades of the mentally defective have been included, but not the dull and backward. The case which stands apart from the others with an I.Q. of 82 has been certified as a moral imbecile and is now in an institution; he has a feeble-minded sister with an I.Q. of 70 in the same institution. The distribution under larger groups, namely, five points of the I.Q., is shown in Diagram 2, to which reference has already been made. In the lower line the actual numbers contained in each group are given. As above stated, the figures for the imbecile group represent only about half of the actual numbers examined, the remainder being unclassifiable in terms of the I.Q. A considerable number of children who were found to be classifiable as dull and backward only were also examined in sufficient detail for a determination of the I.Q. to be possible. But as this number represents, of course, only the fringe of the total group of the dull and backward—namely, those who were suspected of mental defect—it is impossible to draw any conclusions from the actual numbers so found or from the distribution of the

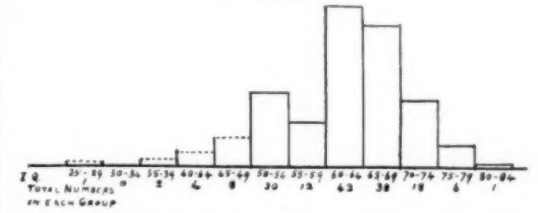
Diagrams Showing the Distribution of the I.Q.'s in the Feeble-minded and Imbecile Groups.

DIAGRAM 1.



The number of cases for each I.Q. is shown by the height of the vertical lines over the base line.

DIAGRAM 2.



The rectangles for the groups below 50 do not represent the total numbers in these groups, as is indicated by the broken line at the top.

I.Q.'s. As might be expected the majority of the I.Q.'s fall into the border-line group of 70 to 80.

In this connexion it is interesting to compare the results obtained in a school where all the children were examined. The school was in the area in question and contained 50 children. Among these unselected children the average I.Q. was 94, which is rather below the average found by Terman, as might on several grounds be expected. The highest I.Q. was 137, and the lowest 47. There were four children who fell below the border-line of mental defect, whose I.Q.'s were 47, 62, 66, and 67. The two last are members of the family reported in detail below.

With regard to the distribution in individual schools of the mental defectives, this is very variable, as would be expected where the schools are small ones. There are in all 80 schools in the area, and the variation is from *nil* in some schools to nearly 10 per cent. in others. Part of the variability is probably only apparent, and due to incomplete ascertainment; of the part that is real some is due to the smallness of the numbers involved; while some is the result of local conditions, including the nature of the employment available, the greater or less desire of the employers to get a good type of employee, and other conditions which determine the type of family to be found in a given locality.

Characters of Mental Defectives.

The problem before us now is to consider the future of these mentally defective children when they reach adult life. The imbecile group are in most cases necessarily incapable of even partial self-support. They either find their way into institutions or remain as burdens on their families. Though to the uninstructed this group forms the most obvious part of the problem of mental defect, it is far less important sociologically than the higher group. What follows will relate almost entirely to the feeble-minded.

Unfortunately I have no personal experience of the problem of mental defect as it exists in towns. It is, I think, generally admitted that a lower level of intelligence is required for self-support in rural areas than in towns, owing to the simpler conditions of environment. Moreover, the opportunities for adopting evil courses are fewer in the country than in the town, and for this reason mental defectives in the country are less likely to come in contact with the police. We might expect to find, therefore, as we actually do find, a larger proportion of mental defectives existing in the country than in the towns; but that many or most of these defectives are capable of more or less complete self-support; and that their mental defect is evidenced, not in most cases by such gross abnormalities of conduct as would be likely to bring them into conflict with the forces of law, but simply by a very low level of intelligence. As a result of this low level of intelligence their self-support tends in many cases to be only partial, and to be supplemented by a greater or less amount of relief from the guardians or from private charity. We find in rural districts, as well as in towns, that the feeble-minded exhibit complete improvidence in marriage and the production of children; their families are usually chronically filthy and neglected, and they are incapable of maintaining any standard of life in the home. The girls frequently become the mothers of illegitimate children.

We must also recognise that, whatever may be the number of actual defectives present, this number represents only the fringe of a very much larger class of subnormal and degenerate individuals, whose capacity for mental development is very limited, whose sphere of usefulness as citizens is correspondingly circumscribed, who may indeed be a burden rather than a help to the community, who tend to transmit to their offspring hereditary qualities of degeneracy and defect, and who, owing to a high reproduction rate, are increasing in numbers relatively to the rest of the community.

Owing to the fact that the present investigation has been in progress for less than three years, it has not been possible to follow children from school up to adult life. But reports on the subsequent progress of a few of the children who have now left school are available. The boys appear in most cases to be employed in helping their fathers or in doing odd jobs on the land; sometimes they are capable of earning a normal boy's wage, but in other cases are unemployable. The girls appear usually to help in the home, and probably the majority will be sent out to service later on.

The best picture of what the feeble-minded child is likely to become may in many cases be obtained from the parents. The father is usually not seen when the home is visited, but in a large proportion of cases the mother appears, from the impressions formed in an interview, which are often confirmed by common repute, to be of very low intelligence. In some cases it is even possible to see in the course of a brief conversation that she is feeble-minded, in which case she exhibits the characteristics above mentioned.

Descriptions of Individual Families.

The following descriptions of individual families will serve to illustrate the characteristics of mentally defective stocks as they exist in a rural area.

H. family. The mother is obviously feeble-minded, almost at first glance, and is generally recognised as such. The father I have not seen, but he is in regular work at a weekly wage of 27*s*. When I last saw the family a few months ago there were six children, ranging from 15 to a little over a year in age, and a new baby was imminent. Owing to difficulties in getting anyone to undertake the care of the mother during confinement it was suggested that she should have her baby in the workhouse, which, in fact, she actually did. When I first saw the family in 1921 there were three children at school, in a filthy and very offensive condition, and the state of the home corresponded with that of the children. The family has since been under the regular and frequent supervision of the National Society for the Prevention of Cruelty to Children, and conditions have improved somewhat, but are still very bad. The three children at school were examined in 1921 and their condition was as follows: C—, male, aged $11^{9}/_{12}$ years, feeble-minded, I.Q. 63, harmless and well-behaved; will probably have enough intelligence for work on the land. R—, female, aged $9^{5}/_{12}$ years, feeble-minded, I.Q. 51, physically very poorly developed; probably has not enough intelligence to be even partially self-supporting. This child has now been sent to a special residential school. Q—, female, aged $5^{8}/_{12}$ years, dull and backward, bordering on feeble-mindedness, I.Q. 76, too early to give a definite opinion as to whether she may not be ultimately certifiable as feeble-minded. I have not examined the eldest boy or the younger children.

The salient points about this family may be summarised as follows. Mother feeble-minded and quite unfit to look after a family; two at least out of three children examined feeble-minded, and doubtless a proportion of the rest.

B. family. Father employed on a farm; mother not obviously feeble-minded; the children are rather badly kept and appear poorly nourished. There have been 15 children in the family, of whom 13 are now living. The elder boys are employed on the land and the elder girls in domestic service. All the four children at school between the ages of 7 and 14 were examined by me in October, 1922, and their condition found as follows: P—, male, aged $11^{10}/_{12}$ years, I.Q. 61; S—, female, aged $9^{9}/_{12}$ years, I.Q. 64; D—, male, aged $8^{7}/_{12}$ years, I.Q. 68; M—, male, aged $7^{5}/_{12}$ years, I.Q. 65. All these four children are feeble-minded. The head mistress states: "I do not think any amount of teaching will make them normal. They have no reasoning capacity at all." The two elder boys of those examined have exhibited cruel tendencies, and one of them in a composition described an escapade in which he and his brother stamped a duck to death as the funniest thing he had seen in his life. From the headmistress's account it appears that two older brothers, who have now left school, were of the same mental level.

It seems probable, to judge from the children themselves and the family record, that these children will be capable of employment, the boys on the land and the girls in domestic service. But the boys would probably fail in a town environment. The last addition to the family of which I am aware took place just over a year ago, and has since died.

Q. family. The point of interest about this family is that I examined all the children then at school during the course

of an examination by intelligence tests. There were five children attending school, of whom the particulars are as follows: L—, female, aged $12^{2}/_{12}$ years, I.Q. 66; F—, male, aged $10^{11}/_{12}$ years, I.Q. 67; C—, female, aged $9^{8}/_{12}$ years, I.Q. 86; T—, female, aged $7^{4}/_{12}$ years, I.Q. 81; O—, female, aged $5^{9}/_{12}$ years, I.Q. 90. There are in addition three other children not yet at school who were not examined, and one who died in infancy. It will be seen that the children tested range in intelligence from a low average through dull and backward to definitely feeble-minded. The home conditions are and have been deplorable, and the children are poorly nourished, dirty, and generally neglected. The family has migrated a good deal. The father is said to be a poor specimen and a bad workman. The mother appears feeble-minded. She has not the intelligence even to alter garments given to her so as to make them fit the children. The schoolmistress attributed the mental retardation of the children to bad home conditions and frequent migrations, but this does not fit the facts of the case so well as that of an hereditary defect appearing to a greater or less extent in the children, apart altogether from the general truth that the I.Q. gives a measure of native intelligence which is but little altered by ordinary variations of environment. C—, for example, has a slightly higher mental age than L— ($8^{2}/_{12}$ years and 8 years), who is nearly three years her senior in chronological age. It is impossible to explain this as the result of the environment, which has acted equally on all the children, whereas it is well known that ancestral characters are inherited to a greater or to a less extent even in children of the same parents.

T. of S. The father of the legitimate children is feeble-minded, a fact apparent on ordinary conversation. Mother is feeble-minded, or perhaps an imbecile. She is quite unable to manage her home, and the children were shockingly neglected, but have improved somewhat under the constant supervision of the N.S.P.C.C. The family, when first seen by me in 1921, consisted of three boys, and there has since been a new baby. Details are as follows: D. S., mother's illegitimate child, aged $12^{7}/_{12}$ years, I.Q. 51, feeble-minded; could not be taught even to read or write at school; since leaving school over a year ago he has done a little work in the fields, but at the time of my last seeing him in April, 1923, was not doing anything. In view of his low level of intelligence it is very doubtful if he will ever be able to obtain regular employment. His intelligence is so low that even now he cannot give the date of the year or reckon change of money. The two other children, J— and B—, aged $7^{6}/_{12}$ years and $4^{9}/_{12}$ years at the time of first examination (now 10 and 7), are both imbeciles, and have been excluded from school. In spite of his mental defect the father appears to be a steady workman.

T. of L. The children of this family are first cousins to the preceding, the fathers of the legitimate children being brothers. In this case I have not seen the father. The mother is possibly feeble-minded, but this is not immediately apparent. There were in 1921 six living children in the family, and in addition two had died, and another baby was expected in a few days. The children at school were first seen by me in September, 1921. There were four, of whom details are as follows: R—, male, aged $13^{3}/_{12}$ years, the mother's illegitimate child, but by the same father as the rest, feeble-minded, I.Q. 53, head circumference 20¼ in.; at school he could not be taught to read anything beyond a few easy words. He has now gone with the family to a different part of the county, and the voluntary visitor of the Association for Mental Welfare reported in March, 1923, that he was able to work, but that his mother's account of his behaviour left no doubt that he was defective, and stated that he was then at work. P—, male, aged 12 years, feeble-minded, I.Q. 61, of higher grade than his brother; head circumference 20¼ in. The same visitor reports that according to his schoolmaster's account he is simply rather backward in his work, owing probably to irregular school attendance and frequent migrations of the family, and that it is absurd to call him mentally defective. S—, female, aged $10^{11}/_{12}$ years, feeble-minded, I.Q. 58, head circumference 20½ in.; there is nothing in the appearance of the child to indicate mental defect; she has a bright, winning smile, and pleasing manner. She was retested independently by another school medical inspector in July, 1923, and found to have an almost identical I.Q. of 55. The voluntary visitor again reports that according to her schoolmistress's account she is dull in some subjects, but in ordinary life she is quite normal, and expresses his doubt as to whether she is mentally defective. H—, female, aged $8^{4}/_{12}$ years, passed all the seventh year tests and was not further tested; her I.Q. was therefore at least 84 and probably higher, indicating a dull or possibly low average intelligence, not approaching mental defect; head circumference 21 in. I have not examined the younger children.

In this connexion it is interesting to note the extreme unwillingness of teachers and visitor to admit that the backwardness of the two children now at school is due to mental defect, although it brings them well within the border line of feeble-mindedness, and though the visitor admits the presence of one defective in the family. In reference to this the head circumferences are interesting. H—, who is of merely dull or possibly low average intelligence, and who is the youngest of all the children examined, has a larger head circumference than any of the rest, which is up to the average; in the case of each of the others the head circumference is an inch or more below it. The correlation between a small head circumference and low intelligence is, of course, not perfect; but in this case the facts are certainly in favour of the view that the backwardness is due to mental defect, and not to migrations, &c., unless, indeed, it is argued that migrations and irregular school attendance can cause a failure to grow or a shrinkage of the cranium.

N. family. The two youngest children of a family of seven were examined at school in May, 1921. L—, female, aged $8^{10}/_{12}$ years, feeble-minded, I.Q. 66, head circumference 18¾ in.; she was recently under treatment for gonococcal vaginitis mysteriously acquired. E—, male, aged $7^{9}/_{12}$ years, feeble-minded, I.Q. 60, head circumference 19 in. Of the remaining five children, who have now left school, it appears from the mother's description that one is an idiot, another a low-grade feeble-minded, while the other three are stated to be normal. The mother appeared normal in the course of a short interview; the father was not seen. The elder boy mentioned above as being according to his mother's account feeble-minded, recently suffered three months' imprisonment on a charge of indecent assault of a little girl of another family. There can be no doubt that he is feeble-minded, to judge both from his school record and his mother's account, but the question never came before the bench.

I have selected the above families for special report, both because they are some of which I have most complete records, and because they are illustrative of the characteristics of defective families as they exist in a rural area. They are, it is true, some of the worst families with which I have had to deal, but they are typical of many.

The points illustrated may be summarised as follows. In a rural area many undoubtedly defective families are able to obtain a living and bring up a family—after a fashion; on the other hand, they may collapse entirely and drift into the workhouse with their families. The home conditions are frequently very bad and the children badly neglected. Children are produced in unlimited numbers apart from any prospect that the parents will be able to support them. Illegitimacy is a frequent occurrence in such families. Sometimes more serious offences may be committed as the result of mental defect. It will be seen that in some families all the children are imbecile or feeble-minded, in others only a larger or smaller proportion, though the rest are frequently subnormal.

Summary and Conclusion.

The present investigation has shown that, in the rural area examined, there exists among the school population a very high proportion of mentally defective children. The number so ascertained amounted to 3 per cent. of the school population under review, and of this percentage 0·5 per cent. were classified as imbeciles, and 2·5 per cent. as feeble-minded. We also showed reason for thinking that the actual percentage found fell short of the real number present, and that this number was probably somewhere in the neighbourhood of 4 per cent., or even higher. We explained the greater prevalence of mental defect in the rural area investigated, as compared with the usual numbers given for towns, by the lower level of intelligence required for more or less complete self-support in the simpler environment of the country.

By a consideration of typical families we showed that the mentally defective children were in most cases the offspring of generally degenerate stocks, the members of which were incapable of performing in any adequate way the duties and responsibilities of citizenship, but who were not incapable of earning a living of some sort in a rural environment. We thus obtained a picture of the kind of adult into which the mentally defective child was likely to develop.

I am indebted to Dr. C. E. Tangye, county medical officer of Wiltshire, for his permission to publish

this report, and also for his advice in its preparation. My thanks are due to Dr. R. C. Monnington, of Salisbury, both for his assistance in the writing of the report and for his constant help and guidance during the whole time that the work on which it is based has been in progress. In addition, I should like to express my gratitude to those numerous teachers who have given me help in the investigations of individual children.

BLINDNESS AND OTHER OCULAR DEFECTS DUE TO NASAL DISEASE.

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THE following cases illustrate how blindness and other ocular lesions may be produced by inflammatory conditions in the nose. In all but the most recent text-books little emphasis is placed on the frequency with which nasal disease may be the cause of ocular defects. One cannot refrain from the reflection that in the not distant past many patients were allowed to lose their sight for want of a timely operation on the nasal sinuses.

Of 600 cases of orbital inflammation Hirchfield found 400 due to sinus disease, and Holmes considers that 40 per cent. of ocular lesions originate in the nose. These figures are not surprising when one considers that, save on its external aspect, the orbit is surrounded by the nasal sinuses which are constantly exposed to infective processes. Dimness of vision, congestion of the conjunctiva, enlargement of the caruncle, œdema of the eyelids, corneal ulcers, iritis, choroiditis, orbital cellulitis, tearing and other lacrymal affections, and optic neuritis may be mentioned among the eye conditions that may be due to nasal disease.

CASE 1.—Woman, aged 31, sent to the Throat Hospital, December, 1917, by Dr. Stroud Hosford, who reported vitreous effusion and opacities. General œdema and turbidity each retina, suggesting septic absorption. There was aching round the left eye for several months, misty vision at times, and some nasal catarrh. The middle turbinates were large; these were removed and some ethmoid cells opened. No pus was seen. Improvement in condition was rapid.

CASE 2.—Woman aged 29. Consulted me in 1919 for slight deafness and pain in the ears. There was a history of some post-nasal catarrh. She had choroiditis in both eyes for four years; at intervals crops of spots appeared on the fundus, some of them becoming permanent, so that by this time she was nearly blind in the left eye. The Wassermann test had been done four times, always negative. No hope of saving the sight was given her either in London or New York, and she had resigned herself to eventual blindness and devoted her time to learning Braille. In spite of the nose appearing normal, but taking into consideration the post-nasal catarrh, the occipital headache, the pain in the ears, and the deep-seated aching behind the eyes, I determined to explore the ethmoid and sphenoidal cavities. The ethmoid on both sides was found diseased, soft, and easily broken down, evidently the seat of a chronic inflammation. The sphenoidal sinuses were opened, but no pus was seen. With the exception of a temporary crop of spots on the right fundus a few weeks after the operation she has had no further eye trouble, and the headache and aching at the back of the eyes have disappeared.

CASE 3.—Man aged 50. In November, 1917, had antra opened and polypi removed. In February, 1922, when in the country, the left eye became red and swollen, and he was treated for erysipelas. When the swelling subsided in a week's time he noticed he was blind in the affected eye. Went to Westminster Ophthalmic. Report: optic disc pale, proptosis, slight conjunctivitis. March 14th: Referred to Golden-square. Eye normal externally, save for slight proptosis; unable to distinguish light from darkness. Operation same day. Ethmoid exposed by external incision. Large hole ¾ inch in diameter found in the os planum, but no pus seen. The ethmoid was cleared out and the sphenoidal sinus opened. No recovery of sight occurred. This case is cited to illustrate with what rapidity the sight may be permanently destroyed—that is, not more than three weeks.

CASE 4.—Woman aged 27. Sent to me in 1916 by Mr. Kenneth Campbell. He reported optic neuritis in each eye. There was a history of influenza two months previously, and for six weeks she complained of pain in the ear, at the back of the eyes, and across the bridge of the nose. On Feb. 26th, the day of the operation, she could only distinguish between light and darkness. The right disc was indistinct and pale; the left showed marked papillitis. Elevation 1¼ D. Beyond a slight deviation of the septum high up the nose appeared normal. The middle turbinates were not enlarged, and no pus was seen. In order to give more room in a narrow nose the septum was resected; it was thicker and more deviated than it appeared, and its removal allowed one to see the posterior ethmoid region, which was of a uniform dark plum colour. This was found to be almost as soft as butter. No pus was seen. The following day she could see quite well, and in four weeks' time Mr. Campbell reported vision 6/6 in each eye. The sphenoidal sinuses were opened, but appeared healthy. The almost immediate return of vision indicates that the condition was merely due to œdema or pressure on the nerve in the optic foramen.

Nasal Disease in Relation to Optic Neuritis.

Optic neuritis is undoubtedly the most interesting type of eye case that the nasal surgeon has to deal with, whether considered from its direful effect on vision or the dramatic swiftness with which certain cases of blindness are not infrequently restored to sight. In 1892 Caldwell reported a case due to sphenoidal disease, and Krause reported three cases in 1895. Some years later StClair Thomson reported a similar case. It was not until 1912, however, that Onodi, by his classic work on the nasal sinuses, focused attention on the subject. He demonstrated the varying and intimate relations of the optic nerve and nasal cavities, particularly the frequency with which the posterior ethmoidal cell enters into the formation of the optic canal. When this occurs the intervening bone is sometimes as thin and transparent as tissue paper; even this may be absent, so that the sheath of the nerve lies in direct contact with the lining membrane of the sinus. It must not be forgotten that the veins of the nose communicate directly with those of the dura and orbit.

The few post-mortems that have taken place show that the path of infection is by direct continuity of tissue—that is, there is a periostitis and an osteitis, the inflammation spreading thus to the sheath of the nerve. Infection may also occur by way of the veins and lymphatics. In a case of sphenoidal empyema Ortman found that diplococci extended through the periosteum and bone to the dura, and Hajek, in a case of ethmoiditis and meningitis, traced streptococci in the veins which extend from the ethmoid to the dura. One feels that as our knowledge increases many cases formerly labelled as toxic will be found to be due to a more definite pathological entity. Many cases of optic neuritis have now been reported in which nothing abnormal could be detected in the nose, yet on operating on the apparently sound ethmoid it is found to be diseased. This is due to a rarefying osteitis which softens and disintegrates its delicate walls without the formation of pus. Whether this is merely produced by a chronic congestion or is helped by some specific infective organism it is difficult to say, but there is no doubt that it frequently follows a severe cold or an attack of influenza. It would appear that this congestive process has a more penetrating action than that associated with pus.

The nasal surgeon in dealing with optic neuritis must bear in mind other factors which may be the cause of the disease. Syphilis, disseminated sclerosis, tobacco, alcohol, intracranial tumours, and toxæmic conditions, whether due to teeth, tonsils, or intestines, must be carefully investigated. The usual history is that some weeks after an attack of influenza or severe cold there is loss of sight generally in one eye, accompanied by deep-seated pain behind the orbit, occipital headache and perhaps pain in the ears, the eyeballs may be tender on pressure or their movement may be painful, and there may be a history of post-nasal dropping. These symptoms are of the greatest significance and help in diagnosis. Externally the eye is of normal appearance, and sometimes in the early stages nothing abnormal can be seen in the

fundus. Characteristic signs, however, soon appear with papillitis and dilated retinal veins.

Permanent blindness may take place in two or three weeks. On the other hand, recovery has occurred after the lapse of several months.

Practical Conclusions.

A skiagram should always be taken. It may reveal an exostosis, a pituitary tumour, or other intracranial disease. It is not reliable or of much help where the sphenoid or ethmoid is concerned, although White, of Boston, says seven out of a series of 20 cases gave a positive photograph. It is well to remember that a sinusitis may be associated with an optic neuritis without having any causal relation (Onodi).

Where there is obvious nasal disease the duty of the surgeon is clear and the sinuses must be explored and laid open, but there is the type of case where no abnormality can be seen in the nose. Nevertheless, in these cases, every other cause of optic neuritis having been as far as possible excluded, there should be no hesitation or undue delay in exploring the ethmoid and opening the sphenoidal sinuses. The danger of doing so is negligible, and should not be considered in view of the gravity of the case. It is the only certain method of finding out the condition of these parts. In a narrow nose I advocate submucous resection of the septum, whether deviated or not. The extra room thus obtained will ensure a better view and enable one to carry out a more complete and satisfactory operation.

EARLY PERICARDOTOMY IN THE TREATMENT OF PERICARDITIS

SECONDARY TO OSTEOMYELITIS OF BONE.

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PERICARDOTOMY for purulent pericarditis is at present a not infrequent procedure, and with the improvement of modern operative technique will be resorted to more often in future. The mortality from the operation is of necessity very high, so that it is undertaken only as a life-saving measure. The number of recoveries is much greater when the pericarditis occurs in the course of pneumonia or rheumatic fever than when it follows osteomyelitis of bone, the reason not being far to seek, for the latter condition is one manifestation only of a general pyæmia, and metastatic abscesses of the heart muscle itself usually coexist.

Thirty-six cases of pyopericarditis secondary to osteomyelitis of bone have been recorded in which drainage of the pericardium was performed. Recovery after operation took place in two instances only. A few of these cases are tabulated.

Cases Illustrating Importance of Early Operation.

The explanation of this high mortality probably lies in the delay in operative interference. For example, in 20 of the 36 cases pericardotomy was performed three to four or even ten days after fluid in the pericardium had been definitely diagnosed clinically, both by signs and symptoms, and by aspiration.

A good illustration of this is to be seen in the case of G. H. (No. 6 in table). The child was admitted into hospital with an acute osteomyelitis of the left femur of seven days' duration. Immediate operation was performed, and the whole of the shaft of the bone opened up and drained. Eight days after operation the boy showed no sign of improvement, and physical examination of the chest revealed the presence of a pericardial effusion, which was tapped. Turbid serum was drawn off, but at the end of 48 hours no micro-organisms were grown from it. Ten days later the pericardium was again tapped. This time pus was drawn off which, on microscopical examination, revealed the presence of large numbers of *Staphylococcus aureus*. Pericardotomy followed, with death 24 hours later. At the post-mortem examination a pericardium full of pus was found, with a small abscess in the myocardium which had ruptured into the pericardial sac. No other pyæmic foci were present.

The other examples are all similar, in that pericardotomy was delayed until needling of the pericardium revealed a purulent change in the pericardial fluid.

Name.	Duration and site of bone disease.	Length of time after onset before heart lesion.	Date of operation and description of findings.
1. Emma G., aged 14.	Ilium. 7 days.	12 days.	19th day: Pus. *Staph. aureus.* Death.
2. Cecil C., aged 9.	Femur. 2 days.	6 days.	8th day: Pus. *Staph. aureus.* Death.
3. Female.	Tibia. A few weeks.	Asp. twice. Last 5 days before py. Fluid sterile.	3 days after asp. Pus + +. No microscopical examination.
4. Female, aged 6.	Rib. Metatarsal. Ill six weeks.	Pm. Asp. 8 days and 4 days after admis. Fluid sterile.	Py. 10 days after admis. Pus + +. Death.
5. Child, aged 7.	Tibia. Not stated.	Signs of effusion 6th day. 8 days after this pm. tapped. Fluid sterile.	Tapped 10 days later. + + pus. Py. Death.
6. G. H., aged 11.	Femur. 1 week.	8 days later pm. tapped. Fluid sterile.	18 days later tapped. Pus + +. Py. third. *Staph. aureus.* Death.

Asp. = Aspiration. Py. = Pericardotomy.
Pm. = Pericardium.

Turning now to the two records where recovery ensued.

The first occurred in a lad aged 11. Henry P. was admitted into hospital with a two days' history of malaise and fever, with pain and tenderness over the right tibia. Immediate operation was performed, and the shaft of the tibia opened and drained. Eight days later the patient's condition was much the same as on admission, temperature 101° F., pulse 110–120. Physical examination of the chest revealed for the first time the presence of a pericardial rub situated at the base of the heart at the third left costo-sternal junction. The following day the rub had altered in position and character. It was now heard nearer the apex of the heart opposite the costo-sternal junction of the fourth left rib and only faintly. On the third day it had disappeared altogether and there were definite signs of fluid in the pericardium. On the twelfth day after admission the boy's condition was still serious, and the pericardial dullness extended half an inch to the right of the sternum, and to the left as far as the anterior axillary fold. The pericardium was tapped and slightly turbid fluid drawn off. This was thought to contain pus, so that immediate pericardotomy followed. Subsequent bacteriological examination of the fluid demonstrated the surprising fact that it was sterile. Twelve hours afterwards the wound was discharging pus containing a rich growth of *Staphylococcus aureus*. Subsequently, both pulse and temperature subsided rapidly and uneventful recovery took place. At the end of three months the boy was discharged to a convalescent home with the wound healed, and capable of doing a fair amount of active exercise. No signs of adherent pericardium were present.

The second recovery occurred in a boy, George H., aged 12, who was admitted to Guy's Hospital with 24 hours' history of pain in the left calf. On examination marked tenderness was found on deep pressure over the lower end of the left fibula, with swelling, heat, and œdema of the leg. Osteomyelitis of the left fibula was diagnosed, and immediate operation performed. Ten days afterwards he developed a pyæmic abscess in the shaft of the left tibia, which was drained but did badly; so that a Gritti-Stokes amputation was necessary on the fourteenth day. On the twenty-first day a metastatic abscess appeared in the upper end of the shaft of the left humerus. Seven days later a distinct rub was heard over the base of the heart, which disappeared six hours later. Meanwhile, the limits of cardiac dullness were extending and signs of pericardial fluid were now well marked. Twelve hours later the pericardium was needled and slightly turbid fluid evacuated, which on subsequent microscopical examination proved to be sterile. At the time the fluid was thought to be infected and pericardotomy was performed, a rubber drainage-tube being left in situ. Four hours after operation the fluid draining from the tube was distinctly purulent, and when examined microscopically

Staphylococcus aureus was seen in large numbers. Recovery in this boy was uneventful, and he is now walking about the ward. There are no obvious signs or symptoms of adherent pericardium.

In both these cases it will be noticed that the primary disease of bone was operated on at a comparatively early stage, and the pericardium drained before the effusion had become purulent. It is a matter for serious consideration, from this experience, whether it is advisable to perform early pericardotomy in cases of bone disease before the effusion has become purulent. The evidence seems all in favour of so doing.

Danger of Delayed Operation.

In the first place, pericardial effusions occurring during the course of osteomyelitis, if not purulent in the early stages, almost invariably become so later on, for, being pyæmic in origin, there are usually coexisting abscesses in the heart muscle. Besides, the danger of the operation is much less if done early, for the general resistance of the patient is then altogether higher. Further, the mechanical interference with the heart's action caused by the fluid will be removed, and hence the heart and circulation will be in a better condition to deal with the foci of infection. If, on the other hand, the fluid is allowed to remain until it becomes purulent, the outer layers of the heart muscle, bathed in pus, will lose their vitality, with great functional impairment of the whole organ.

Blind needling of the pericardium in more than one case has led to puncture of the heart itself, a dangerous accident; what is more, it is almost impossible to drain a pericardium efficiently by needling, because the bulk of the fluid lies behind the heart in the oblique sinus and is difficult to get at. The heart is thus pushed forward and is directly in the way of the exploring needle. Finally, if the pericardium is drained before pus forms, adherent pericardium is a less likely sequel.

In conclusion, the successful treatment of purulent pericarditis depends first of all upon the early diagnosis and treatment of the bone lesion. If the bone is efficiently drained at an early stage in the disease this complication can often be obviated. On the other hand, if the patient is left too long before active intervention is resorted to, pus may make its appearance in the pericardium at a very early date. There is no definite index as to how long it takes for a pericardial effusion to become purulent. It is very variable and depends upon a variety of factors. In every case of osteomyelitis a sharp look-out should be kept for the appearance of a suction sound at the base of the heart. When it is quite definitely present the heart should be examined at least every six hours, for the rub may change its position and fluid appear quite rapidly. If fluid is present recourse may be had to needling, but as a diagnostic measure rather than as a method of treatment. If fluid is withdrawn then the suggestion is that immediate pericardotomy should be performed.

I am indebted to Sir Alfred Fripp for his kind permission to publish these cases.

THE TREATMENT OF EPILEPSY WITH DIALACETIN.

BY SIDNEY H. HALL, M.D., C.M. EDIN.

IN the treatment of epilepsy one of the most important factors is the early recognition of prodromal signs. These have been recently considerably extended, particularly in the psychical sphere. Putting the matter shortly, these prodromal signs vary from alterations in mood and manner, from extreme depression and irritability to the heights of gaiety, optimism, and evanescent brilliance. Those who have the daily care of epileptics can, by a due and keen observance of these psychic variations, often take measures to ward off an attack. In the treatment of epilepsy on a large scale the first principles appear to be a careful dietary and regimen coupled with the treatment of any concomitant organic disease. The physiological and therapeutic effects of bromides are well known. All practitioners, however, find amongst their cases of epilepsy what are termed "bromide failures," usually the class which fills special institutions and colonies.

No one of any experience would think of passing an opinion on the value of any remedy for epilepsy until such remedy had been tried for at least three months. In the cases on which I base the remarks to follow the period of observation has been over six months.

Nature, Dosage, and Effects of Dialacetin.

The drug on which the following reports are based is known as dialacetin, and is stated to be a combination of dial (well known as a most useful hypnotic) with allyl-paracetamino-phenol, the latter element in the combination having analgesic and antipyretic properties. Prof. Cushny, in his "Text-book of Pharmacology and Therapeutics," awards dialacetin a high place in the treatment of epilepsy, stating, inter alia, that it is preferable to luminal. Each tablet contains 1½ gr. of the former and 4 gr. of the latter constituent. It is well to commence with a small dose—say, half a tablet twice daily—and to increase this slowly until the maximum dose has been ascertained. The tablets disintegrate readily in water and their taste is by no means unpleasant. The only other caution to be issued is that if one desires to avert an increase in the number or intensity of the fits the use of any drug which may have been given before must not be stopped, but the dose lessened gradually and small doses of dialacetin given in addition. The dosage of dialacetin is then gradually increased and that of the other preparation reduced until in about three to five days dialacetin may be given alone in such doses as are found to be needed. The greatest success with this preparation is comparable with that attained by most other anti-epileptic remedies—that is, in cases where the seizures occur in cycles or bouts with a fairly long interval between each series of attacks. Here it is fairly safe to anticipate satisfactory results. The caution mentioned earlier to study the psychical state of the patient and to increase the dose slightly when a cycle is imminent well repays attention. Only one case has complained of a feeling of drowsiness after the use of this drug. In all other cases a pleasant psychical change was noted, the patient appearing more cheery and optimistic, in complete contrast to bromide cases. The drug is well tolerated even when taken over a long period. There have been no cases of skin eruption during its use. Sleep is almost always refreshing, and even those patients who are subject to nightmare state that their sleep is undisturbed.

One would indeed be foolish to claim that dialacetin would *cure* epilepsy; the drug which will accomplish this has yet to be found. But my experience has been that under its use major attacks have been both reduced in violence and frequency and, though it is perhaps early to speak of a lessened mental deterioration in such cases, I am fairly confident that this will be another result. Prima facie one is justified in anticipating this. The only class of case where the remedy named has been a little disappointing was where transient loss of consciousness was the chief or only manifestation; and my experience has always been that treatment of any kind is not helpful in these. My observations are based on the records of 52 cases, and in my opinion justify a much more extended trial of this remedy.

I have used dialacetin, though not in a great number of cases, in nervous manifestations in young children. Two of such cases are of interest. In the first a boy, aged 2 years, with a history of "convulsions" in infancy, there used to be definite convulsions every time he cried. He was a spoilt child, and when he got worked up to the crying point he used to hold his breath, become purple in the face, and then pass into a state of unconsciousness with

some twitchings. These attacks were very alarming and left him very weak. Several sedative preparations, coupled with "suggestive" treatment, were tried without much effect, but with dialacetin the success was complete and he has had no recurrence for about six weeks. The second case was very similar, except that the child here was 3 years old and only cried herself into a fit when she was thwarted or hurt. She also gradually got bluer and bluer in the face and then became unconscious, frequently losing control of the bladder during the seizure. The case occurred shortly after that described above, and I did not try anything but dialacetin, which proved successful almost at once. The pathology of this condition is inexplicable, but most physicians will have met with such cases at one time or another.

I intend to try this preparation in other spasmodic nerve affections of children such as laryngismus stridulus and tetany, where I think it should prove of great value.

Fulham, S.W.

TRAUMATIC GANGRENE OF THE FOOT

COMPLICATING A FRACTURED FIBULA.

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FRACTURES of the fibula per se are generally associated with little displacement and are seldom compound, particularly in the upper third of the bone. Involvement of the external popliteal nerve

FIG. 1.

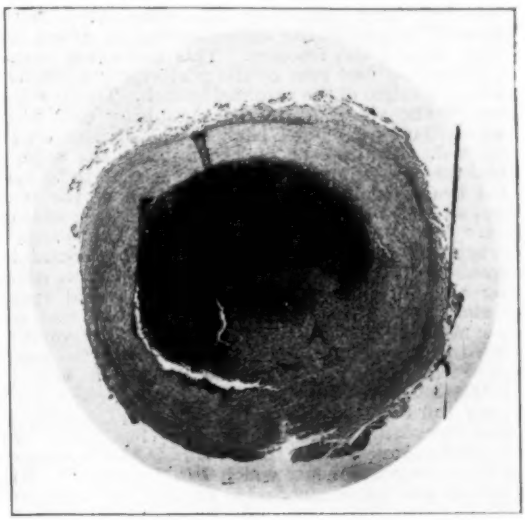
is the only complication of any severity described, and although this may result from the initial trauma, it is usually a later callus involvement of the nerve. Injury to the tibial vessels is of sufficient rarity to merit a description of this case.

The patient was a country labourer aged 36. "Never a day's illness in his life." Whilst cycling on April 5th, 1924, he was run down by a motor-car and sustained an injury to the left leg, immediately below the knee. He was admitted to the Faversham Cottage Hospital under Dr. A. Kennedy, with considerable bleeding from a punctured wound in the upper third of the leg. The bleeding was so profuse that it was thought that a compound fracture must be present with a large wound; examination, however, revealed only a tiny punctured wound over the junction of the upper and middle third of the left fibula. There was no sign of fracture and a firm dressing was applied to control the hæmorrhage. The following day the temperature was 101° F., and the limb much swollen.

An X ray examination on April 7th showed a fracture in the upper third of the left fibula in good position. On the 9th signs of circulatory obstruction became manifest. The patient complained of coldness of the left foot, which presented a bluish appearance, with anæsthesia of the whole foot. By the 17th a definite line of demarcation had appeared around the ankle-joint immediately above the malleoli. (See Fig. 1.)

Condition on Admission.—The patient was admitted to Middlesex Hospital on April 20th under Mr. Sampson

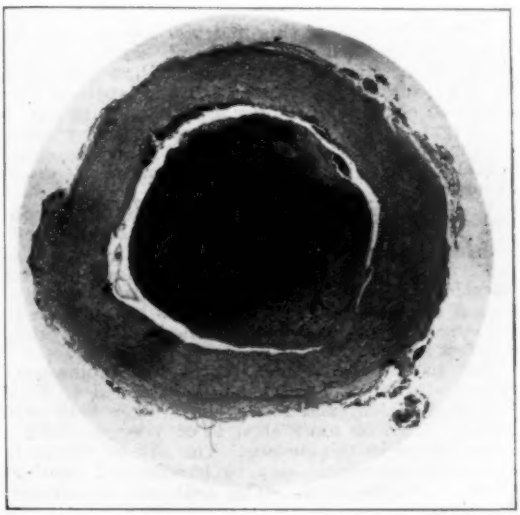
FIG. 2.



Section of posterior tibial artery showing organisation of thrombus, commencing at A.

Handley. He seemed very ill, temperature 103°, pulse 120; the gangrene, however, was definitely of the "dry variety," and strong pulsation was present in the left popliteal artery. On the 26th he suddenly developed a right femoral thrombosis, which quickly resolved. These symptoms suggested the possibility of endocarditis or septicæmia, but a blood culture remained negative, and it appeared to be a postural condition. On May 1st Mr. Handley performed peri-arterial injection of the vaso-motor nerves on the left femoral

FIG. 3.



Section of anterior tibial artery showing organisation of thrombus, commencing at A.

artery in Hunter's canal, but this had no influence on the gangrene.

On the 5th I amputated the left leg at the seat of election, using the equal lateral flap method. This low site was chosen because there appeared to be no organic arterial disease

present, which would have influenced the site had the case been one of senile gangrene. During the operation I was surprised to see no bleeding from either the anterior or posterior tibial vessels, which contained partially organising thrombi, although free hæmorrhage occurred from the sural branches of the popliteal. The external popliteal nerve was undamaged. The stump healed by first intention, and patient made an uninterrupted recovery.

Pathological Considerations.

On carefully dissecting the amputated leg a localised, intramuscular extravasation of blood was found around the fracture. This had come from a wound in the first part of the posterior tibial artery, above the origin of the peroneal branch. The proximal part of the vessel contained organising clot which had obviously extended back to the division of the popliteal. At the seat of the fracture the anterior tibial was also injured. This lesion seemed to be more of a bruise which had caused rupture of the inner coat, and the proximal portion of the vessel contained clot. Section of each vessel (see Figs. 2 and 3) showed no arterial disease, the lumens of each containing organising thrombi. The line of demarcation occurring immediately over the ankle-joint would appear to mark the junction of the cutaneous and muscular zone nourished by the sural branches of the popliteal, with the free arterial anastomosis around the ankle-joint from the malleolar and calcaneal branches of the anterior and posterior tibial vessels. The upper third of the fibula is well-clothed and firmly fixed by muscular origins and ligaments, and relatively immobile, so that a spring-like movement of the upper fragment, which had returned to good position and alinement, wide enough to injure both tibial arteries, must be a rare phenomenon.

I have to express my thanks to Mr. Handley for permission to publish this case, and to Dr. Kennedy for his kindness in placing the initial notes at my disposal.

Clinical and Laboratory Notes.

A NEW FORM OF SUTURE MATERIAL.

BY DONALD MCINTYRE, M.B. GLASG., F.R.C.S. EDIN.,
ASSISTANT TO THE MUIRHEAD PROFESSOR OF OBSTETRICS AND GYNÆCOLOGY, UNIVERSITY OF GLASGOW.

THE production of this material has resulted from dissatisfaction with the present suture material available for closing the uterine incision in Cæsarean section (classical operation). There appears to be a certain element of danger associated with the use of catgut. This results from its slippery surface producing a tendency to loosening of tension or actual unknotting, and from the danger of too early absorption.

On the other hand, unabsorbable material, such as silk, when employed of sufficient thickness to effect satisfactory closure of the wound in the wall of this powerful muscular organ, may lead to minor complications such as adhesions, sinuses, fistulæ, and vesical calculi. Furthermore, it has been shown that a coarse silk suture in the uterine wall may produce a defect in the scar at the site of the suture.

The new material consists of a combination of catgut and silk. The catgut is hardened to 20-day muscle duration, and forms the greater bulk of the suture. Two or more strands of very fine silk are incorporated in the surface. The silk on the surface makes the material easy to handle and eliminates slipping of the knot. The bulk of the suture is absorbed, but the fine strands of silk remain, and so variations in the rate of absorption of the catgut do not constitute a danger.

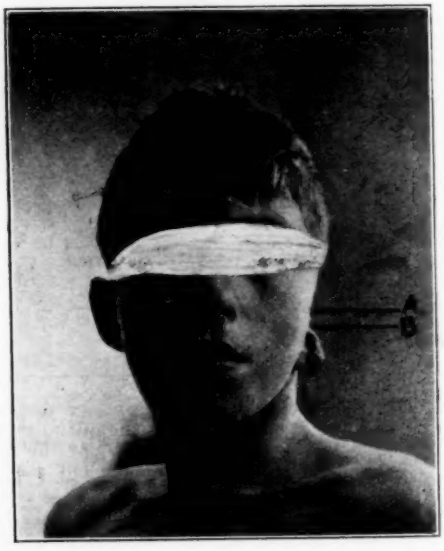
This suture material has been prepared at my suggestion by Messrs. G. F. Merson, Ltd., of Edinburgh. This firm, after a series of careful experiments in combining the two materials, is now able to supply a suture in which the strain when applied is distributed proportionately to the silk and the gut. The silk does not come adrift from the catgut and yet is confined to the surface, being only partially embedded. Messrs. Merson state that "the 'catgut silk-reinforced' may be had in hermetically sealed glass tubes of guaranteed sterility. The sterilising process is carried out during the various stages of manufacture, and after the strings have been tubed, in precisely the same detail as in the case of 'Merson's sterile catgut.' The cost naturally is higher than that of plain catgut, but not so much so as to prove any bar to free use in cases where the ligature is suitable."

The employment of this suture material was first suggested in a paper submitted to the Section of Obstetrics and Gynæcology of the Royal Society of Medicine on June 5th, 1924, when specimens of the material were demonstrated. While originally evolved in connexion with the operation of Cæsarean section, it is suggested that it might be employed with advantage in other surgical procedures.

DEVELOPMENT OF AURICLE ON SECOND BRANCHIAL CLEFT.

BY SPENCER MORT, M.S., M.D. GLASG., F.R.C.S., F.R.S. EDIN.,
SURGICAL DIRECTOR, NORTH MIDDLESEX HOSPITAL; MEMBRE DE LA SOCIÉTÉ INTERNATIONALE DE CHIRURGIE; LATE ASSISTANT TO REGIUS PROFESSOR OF SURGERY, UNIVERSITY OF GLASGOW.

IN this case the photograph shows a remarkable example of extensive development of the external ear over the situation of the second gill cleft. The boy was sent to consult me by Dr. Frank Mort, of Middlesbrough, with reference to the deformity, as he was about to go to a public school and felt keenly his appearance. It will be noted that in addition to a malformed and displaced auricle there is a hemiatrophy of the left side of the face, and a paresis



of the muscles supplied by the left facial nerve. Closer inspection reveals the presence of a dimple above the malformed auricle, representing the true internal ear, which was skinned over and acting efficiently as an organ of hearing (marked A on photograph). The pointer B indicates the situation of the facial nerve crossing after emerging from the stylo-mastoid foramen, and this in development was pressed on slightly by bands of connective tissue. The auricle itself was clover-leaf shaped. Two portions will be seen in the photograph; the third

portion was situated between the two and running horizontally backwards. The picture was taken immediately before operation on a dull day with faulty apparatus, and I was unable to secure a good lateral view.

At the operation I was assisted by Dr. A. W. Gregorson, and remedied the two defects of shape and position as far as possible. This was done by splitting the two anterior portions of the auricle and bringing between them the middle horizontal part, with adjustments and trimming to resemble the shape of the other ear; also by bringing down a flap of skin from the temporal region it was found possible to increase the size of the newly modelled ear, and pull it up to its proper situation. The operation itself was exceedingly troublesome and tedious, but remarkable recovery followed. The facial paralysis immediately improved, and in six days the patient was able to go home. Since then I have been informed that the ultimate result is one of very material æsthetic improvement. The affected ear is now smaller than the other, but in general appearance it seems as if it had been a normal ear, damaged by a slight accident, and the patient has no longer to endure the jibes of his school friends. With reference to this condition, I have not seen such a marked example published in any text-book.

Reviews and Notices of Books.

DOMICILIARY TREATMENT FOR PULMONARY TUBERCULOSIS.

Second edition. By F. RUFENACHT WALTERS, M.D., B.S., M.R.C.P. Lond., F.R.C.S. Eng., Medical Director, Crooksbury Sanatorium. London: Baillière, Tindall and Cox. 1924. Pp. 288. 7*s.* 6*d.*

THE first edition of this book was published as recently as 1921, and in his preface to this, the second, edition the author denies himself with rare modesty that self-praise which most authors bestow on themselves when they refer to the necessity for the early publication of a second edition. Modesty, as well as intimate and first-hand knowledge of his subject, is, indeed, one of the characteristics of this book, which is a positively encyclopædic collection of recent work on the treatment of pulmonary tuberculosis. The author has no reliable specific remedy to offer for every case, but, as he points out, it seems a pity "that we should not make a more intelligent use of the many excellent remedies and methods of treatment which we already possess." These remedies and methods of treatment he describes in his book, which is full of such profound truths as the following: "Half the tragedies in tuberculosis are caused by the absence of such a record (an accurate temperature record) or its disregard."

The alterations made in the second edition are at the beginning and end, a general review of the subject being given in an introductory chapter, and an additional chapter being added on the public and social relations of home treatment. We regret to differ from the author over his opinion that "consultants who take a special interest in the disease are fairly unanimous in their opinions as to its causation and treatment . . ." Would that they could be! But they still hold widely divergent views as to such important matters as the influence of heredity on the development of tuberculosis and the source of infection in adult life—the relative importance of endogenous and exogenous infection, and the correctness of the Andvord-Römer teaching that practically every case of pulmonary tuberculosis in adult life is due to infection in childhood. And as for treatment, autoinoculation is anathema to some authorities and the therapeutic mainstay of others. By not committing himself to a defence of any of the extreme schools of thought, the author has provided as good a guide to the general practitioner as could be expected in our present state of half-knowledge of tuberculosis.

PHYSIOLOGICAL INCOMPATIBILITIES IN DENTAL SURGERY.

Vol. I.: Amalgams. By U. REINECKE, L.D.S. Edin. Cape Town: Townshend, Taylor and Snashall. 1923. Pp. 137. 10*s.* 6*d.*

Mr. Reinecke has written an interesting book from an unusual angle which challenges the long-accepted routine of conservative dentistry. His point of view may be summed up thus. The practice of filling teeth with materials which are chosen for their permanence and stability, regardless of the fact that physiologically they are entirely different from the dental tissue they replace, is wrong and may lead to various local and general disturbances. In this volume he limits his consideration to amalgam, which constitutes the vast majority of fillings. He contends that the metals of which the amalgams are composed may undergo dissociation in the mouth. The metallic ions may penetrate the devitalised dentine and come into contact with the protoplasm in the living dentine. This in turn will become devitalised by the toxic action of the metallic products and eventually lead to death of the pulp. Still further the gum, periodontal membrane, and bone may become damaged and even die as the result of long-continued metallic absorption. The staining of dentine by copper amalgam, which has hitherto been regarded as evidence of its penetration and power to sterilise infected dentine, so far from being an advantage, is, according to Mr. Reinecke, a grave defect. Its caustic action cannot be limited to bacteria in the dentine, but must eventually invade healthy tissue and cause its death. In filling teeth the aim of the dentist should not be the obturation of cavities by hard and unyielding material, but rather to replace the missing dental tissue by a material compatible with the teeth.

This point of view is worth consideration, although it might not be easy to find materials which are physiologically compatible and at the same time durable. It cannot be said, however, that Mr. Reinecke provides much direct evidence for his contentions. The fact that copper can be dissociated and evidently does undergo alteration in the mouth, that it possesses toxic properties, and that the tissues of the body under certain conditions can absorb metallic particles—these points are taken as sufficient evidence that copper amalgam used for filling teeth exerts a gradual toxic effect on the teeth, eventually extending to the gum and thence, maybe, to the body generally. Theoretically, all this is possible, yet the clinical evidence which the author adduces is susceptible of other and perhaps more reasonable explanation. Nevertheless, Mr. Reinecke has done good service in drawing attention to the possibility that in concentrating on the mechanical properties of filling materials we have overlooked defects arising from their incompatibility with the dental tissues.

MYOCARDITIS IN CHILDHOOD.

Myokarditis im Kindesalter. By Dr. MATTHEUS VISCHER. Berlin: S. Karger. 1924. Pp. 87. Gold marks 4·20.

IN this monograph the author has given the first half to a critical review of interstitial myocarditis in children with status thymo-lymphaticus, reported in the German literature, along with other recorded cases of interstitial myocarditis associated with myasthenia gravis, Basedow's disease, and polymyositis in children. The second half consists of an analysis of the post-mortem material at the Basle Pathological-Anatomical Institution over a period of six years. Among 793 post-mortem examinations

made on the new-born and children up to the age of 15, 27 instances of interstitial infiltration of the heart muscle were found. There were 32 cases of status thymo-lymphaticus, and four only of these showed post-mortem evidences of myocarditis. Myocarditis was found in two with status lymphaticus. In all other cases the microscopic examination of the heart revealed nothing abnormal. The author concludes from these observations that myocarditis is not a result of a constitutional anomaly in these cases of status thymo-lymphaticus, and has only an accidental relationship with this disease. True cases of primary acute interstitial myocarditis are reported, and attention is drawn to the interesting clinical picture which they presented. There are no new facts bearing on the ætiology of this disease.

FUNDAMENTAL PRINCIPLES IN TREATMENT.

By HARRY CAMPBELL, M.D., B.S., F.R.C.P. Lond., Senior Physician, West End Hospital for Nervous Diseases; late Physician and Pathologist, North-West London Hospital. London: Baillière, Tindall and Cox. 1924. Pp. 177. 10*s.* 6*d.*

Dr. Campbell does not set out to give a systematic treatise on therapeutics, but provides an agreeable combination of criticism, comment, and advice, held together by a strong thread of common sense, and showing the good qualities conjured up by the phrase "an old-fashioned physician." His opening remarks, for example, on the mental and physical personality of the physician contain such shrewd advice as can only be the result of long experience; they avoid, on the one hand, the tendency to see in the sick person only a collection of test-tube reactions, and on the other, the disposition to forget the scientific aspects of medicine in the attempt to impress one's personality upon the patient. He defends empiricism and bases the use of drugs upon experience rather than upon an assumed knowledge of their physiological action and the morbid processes going on in the body, and whilst saying a good word for fads in strict moderation he points out the dangers of their general application. Perhaps the author deals too gently with our own deficiencies when he indicts the system of *lay* education as the cause of the prevalence of quackery (p. 67), for on the next page he cites the case of a lady who had been an invalid for many years, and had consulted doctor after doctor without any benefit, and yet permanently regained good health after a fortnight's treatment by a quack rubber. Failure in handling such an obviously neurotic patient must surely bear some relation to the fact that psycho-therapy, to which Dr. Campbell devotes six chapters, has no place in the medical curriculum. Practical chapters on housing, fresh air, clothing, exercise, and rest are followed by what is plainly the author's pet subject, for over a quarter of the book is given to the consideration of diet, the teeth, and mastication. A collection of therapeutic aphorisms concludes a book which is marked by an easy style and a wide range of interesting subject-matter.

SPIRITUAL HEALING.

A Discussion of the Religious Element in Physical Health. By the Rev. HAROLD ANSON, M.A. University of London Press. 1923. Pp. 211. 3*s.* 6*d.*

SPIRITUAL healing, constructive thought, practical psychology—all these forms of ascetical exercises are much to the fore nowadays, and this book gives us an account of what spiritual healing really is. As defined by the author on p. 79, it is this:—

"Spiritual healing rests on the belief that all men are intended to develop towards a standard of perfection which is ultimately attainable, and that they cannot be said to be in perfect health until they have attained that standard. It is not enough that they should be following their consciences, or that they should be happy and at ease in their present circumstances, or that they should conform to the average ideal of their class or nation. We believe that there is an unseen standard of perfection by which we must all be judged, which we ourselves have the power to evolve through coöperation with God as Spirit."

Again, in his first chapter Mr. Anson says:—

"We should all probably agree that perfect health ought not merely to be concerned with the purely physical reactions towards life, but ought to aim at placing the person in complete harmony with the *whole* environment—spiritual, mental, and physical—in which he has to live."

He does not put forward spiritual healing as though it were a substitute for medicine or psychology, but claims that it is "rather that which makes the best use of all factors of cure in the proportion appropriate to each particular case." And so it comes about that for spiritual healing a knowledge of God (in so far as the finite can understand the infinite) is necessary, and as our minds and spirits can only express themselves through matter we must look upon matter as "the medium through which the Divine expresses itself."

These are difficult subjects, but Mr. Anson treats of them in a simple and reasonable fashion in his chapters on the Nature of God, Worship, God and the Material World, Man, Why we Call Jesus God, the Spirit, Mind and Body, and Sin. The rest of the book is made up of chapters upon Spiritual Healing in Practice, an Examination of "Christian Science," Auto-suggestion and Prayer, and Miracles. Mr. Anson does not desire that the Church should license special healers, a conclusion to which the Archbishop of Canterbury's Committee on the Ministry of Healing came in November last. Another point on which Mr. Anson insists is the necessity for spiritual directors being properly trained. The Prayer Book lays it down that if any person requires comfort or counsel he should go to his parish priest or "to some other discreet and learned Minister of God's word," but the training of the English clergy in matters of mental direction is by no means profound, and the same thing could be said of the training of medical men.

Mr. Anson's book will be found useful by the layman, the priest, and the medical man, and we advise its study by all who are in any way likely to be called upon to help their fellows in the indicated direction. As a pilgrimage to Lourdes is being advertised to start next month from a London suburb, it would seem that opportunities for giving counsel are not wanting.

HOSPITAL ACCOUNTS AND FINANCIAL CONTROL.

By JOSEPH E. STONE, A.C.I.S., Incorporated Accountant: Accountant to St. Thomas's Hospital. London: Sir Isaac Pitman and Sons, Ltd. 1924. Pp. 160. 21*s.*

Mr. Stone rightly regards accounting, in its widest sense, as one of the essential functions in modern hospital management. Only by careful analysis of the facts relating to its external and internal affairs, and by acting in the light of their interpretation, can any hospital maintain an efficient and economic service. This book reaches a high standard of efficiency which should recommend it to all occupied in the accountancy of our hospitals. Mr. Stone is in favour of a system of accounting by units—that is to say, wards and departments of the hospital—in order to see what the various activities cost and where economies may be effected without impairing efficiency. The extreme care with which the many details have been considered will be highly beneficial to the hospitals which are fortunate enough to possess the necessary staff fully to develop the principles laid down. Particular attention is called to the various sources from which hospitals derive their income, the author having devoted much care and assiduity to the lines on which this work should be conducted at the hospital with which he is associated. Other institutions similarly constituted might well follow the principles here enunciated and the means of attaining them. The price of the book is justified by the value of its contents.

JOURNALS.

BRITISH JOURNAL OF SURGERY.—The July issue contains Sir D'Arcy Power's XIII. Eponym—Syme's amputation.—H. P. Winsbury White discusses the radiographic characteristics of urinary calculi, pointing out that calcium oxalate and calcium phosphate stones show best, the others showing clearly but not so distinctly. The only stones that may fail to give a shadow are those consisting of uric acid and ammonium urate in the bladder.—Kenneth Mackenzie reports a case of a large ventral hernia in the left lower quadrant, which was cured by transplanting the left tensor fasciæ femoris muscle to fill the gap.—Luke Koken Ito describes his experimental results upon the nutrition of articular cartilage and its method of repair. He concludes that damaged articular cartilage is replaced by granulation, which passing through the stages of fibrous tissue and fibro-cartilage becomes true cartilage.—Sir Hugh Rigby contributes a paper on external duodenal fistulæ and discusses the treatment. His results show that the prognosis in these cases is infinitely better than is generally supposed.—Prof. C. C. Choyce analyses 59 reported cases of traumatic dislocation of the hip in childhood, and draws attention to the fact that some of these cases are followed within one or two years by pseudo-coxalgia.—J. P. Buckley discusses the ætiology of the femoral hernial sac, believing that there is no sufficient proof that the pre-formed peritoneal sac is of congenital origin.—A preliminary report, with several excellent colour drawings, is made by A. Tudor Edwards on the use of the thoracoscope in surgery of the chest. He explains its technique and describes the normal and some pathological appearances.—J. Renfrew White describes two bone diseases, one a man of 26 with multiple exostoses and a similar case in a boy of 7 years; in addition he has a case of achondroplasia.—Two simple methods of exposing the humerus and the femur are described by A. K. Henry, which seem to give an easier access to the shafts of these two bones than is attained by other operations.—J. S. B. Stopford, in reporting a case of gangrene of the leg due to obliteration of the popliteal artery, shows how important is the site of the occlusion. Ligature above the origin of superior articular arteries is quite safe, whereas ligature near the inferior articular arteries demands such a complicated system of anastomosis to be opened up that gangrene frequently follows.—T. Twistington Higgins and E. I. Lloyd discuss the subject of mesenteric cysts with reports of two cases.—S. C. Dyke and B. C. Maybury record the results of their experiments on rabbits in attempting to produce an ascending renal infection. They conclude that the production of cystitis fails to give rise to an infection in the kidney, but that infection of the ureter ascended by direct spread along the epithelium.—R. M. Handfield-Jones's Hunterian lecture on retro-peritoneal cysts is reported, in which he discusses their ætiology, symptoms, and treatment.—C. P. G. Wakeley publishes his Arris and Gale lecture on some actions of radiations on living tissues.—C. Max Page's Hunterian lecture deals with the surgical treatment of osteo-arthritis. He divides treatment under four headings: (1) Excision of the joint; (2) arthroplasty; (3) erosion of the joint; and (4) synovectomy, and takes the more commonly affected joints in turn and discusses the results.—Hamilton Bailey and G. P. B. Huddy discuss the treatment of extravasation of urine with especial reference to peri-urethral abscess.—K. W. Montsarrat describes a method of extra-peritoneal approach to the ureter through a mid-line sub-umbilical incision and displacement of the peritoneal sac.—The following rare or obscure cases are put on record. (1) Hugh Reid: A Case of Calculus in the Pelvis of an Ectopic Kidney. (2) C. Hamilton Whiteford: An Abnormal First Rib Producing a Supraclavicular Tumour. (3) W. E. Tanner: An Acute Colic Intussusception in a child aged 2¼ years.

TROPICAL DISEASES BULLETIN. Sanitation Supplement No. 2, June 30th, 1924.—We have previously commented upon the high scientific value of the Sanitation Supplements issued by the *Bulletin* under the able editorship of Lieut.-Colonel W. Wesley Clemesha, and the present number, which contains nearly 100 pages, maintains a high standard. The information is divided into sections, such as disease prevention, water, food, conservancy, small-pox vaccination, disinfection, infant welfare, reports and statistics, notices and reviews. The supplement is well illustrated with diagrams and photographs, amongst which we note some remarkable pictures taken in the Dutch East Indies of the effect of neo-salvarsan upon secondary yaws.

Reports and Analytical Records.

(1) OUABAINE ARNAUD; (2) QUINICARDINE; (3) DIGITALINE.

(From the Laboratoire Nativelle.)

(MESSRS. WILCOX, JOZEAU AND CO., 15, GREAT ST. ANDREW-STREET, LONDON, W.C. 2.)

WE have received from this firm samples of Ouabaine Arnaud put up in different forms and in different strengths, the receptacles bearing full instructions for application and dosage. Ouabaine is a glucoside of the same natural order as strophanthus, and has been described in many places as a substitute for digitalis, but for Ouabaine Arnaud ($C_{30}H_{46}O_{12}$) no such claim is made. The drug, it is suggested, does not replace digitalis preparations but rather completes their effect, much elaborate work having been done to prove the pharmaco-dynamic action of ouabaine as affecting favourably the cardiac systole, while digitalis prolongs the diastole. The drug has the merit also, if the instructions are followed, of being a safe remedy. It is supplied in different forms, as a standard solution 1 in 1000, as tablets of 1/6000 of a grain, and as ampoules of 1 or 2 c.cm. containing ½ mg. of the drug.

From the same laboratory we have received five different preparations of crystallised digitaline, a solution of 1 in 1000, two granular preparations, the granules containing 1/600 and 1/240 gr., and ampoules of different strengths for hypodermic use. Here also full directions are given on the receptacles with the recommended dosage.

We have also received a further sample of tablets of quinicardine, or compressed sulphate of quinidine.

TUBORG LAGER BEER AND TUBORG LIGHT LAGER.

(TUBORG BREWERIES, COPENHAGEN, DENMARK.)

These two beers were bottled at the well-known Danish Tuborg Brewery. When analysed the following results were obtained:—

	Tuborg lager.	Tuborg light lager.
Specific gravity of wort before fermentation	1056·50°	1043·68°
Present specific gravity	1014·78°	1014·14°
Alcohol per cent. by volume	5·4	3·78
Extractives per cent. (total soluble matter)	5·58	4·89
Acidity per cent. as acetic acid	0·08	0·07
Original wort solids fermented (per cent.)	60·5	55·2
Fermentable sugars still present (per cent.)	0·43	1·06
Preservatives (salicylic acid and sulphites)	nil	nil

Both these beers, which were in crown-corked bottles of half a pint capacity, were brilliant and free from any sediment. The palate possesses that softness and delicacy so characteristic of the finer kinds of lager beer. The strong hop flavour associated with our English beer is absent. The lager, which is brewed at a slightly higher gravity than Guinness stout or Bass ale, is fermented to a greater extent than the light lager. The absence of preservatives, the low acidity, and general appearance of the two beers

indicate that great care has been exercised in the choice of materials and in the brewing and bottling process.

ORANGE PIERJAC.

(C. A. LABIN, LTD., 53, PICCADILLY, LONDON, W. 1.)

This preparation belongs to the well-known type of continental "fruit sirops." It is claimed to be made in France and from fresh fruit and sugar only and to contain no preservatives. The Pierjac had the following composition :—

Specific gravity	1300°
Equivalent to	8 lb. per gallon of sugar.
Sugar (as invert sugar)	79 per cent.
Ash	0·1 ,,
Acidity (as citric)	1·18 ,,
Alcohol, gum, glucose, syrup, glycerine, and preservatives (salicylic acid and sulphites)	absent.

These results, together with the presence of a considerable amount of orange pulp, indicate the correctness of the description. That highly refined cane sugar has been employed in this preparation is shown by the low percentage of ash. When mixed with water or soda-water in the proportion recommended Pierjac makes an agreeable beverage with a pronounced but not too strong orange flavour, although to some, especially to adults, the sweetness might be slightly excessive.

"ALOCOL."

(A. WANDER, LIMITED, 45, COWCROSS-STREET, LONDON, E.C. 1.)

This preparation, the full name for which is colloidal hydroxide of aluminium, is supplied in tablet and in powder form, and has claims for consideration in the treatment of disease of the stomach and intestine. As an adjuvant in cases of hyperacidity it has been found valuable in practice. The tablets are supplied in containers of 60 tablets at 3*s*. 6*d*. each. The strength of each tablet is 7½ gr. (0·50 g. of pure "alocol"). They are slightly flavoured and must be broken with the teeth. Their purpose is to make the use of alocol easier for the patient, who can take them at any time and without trouble. "Alocol" powder is supplied in 100 and 250 g. containers at 3*s*. 9*d*. and 7*s*. 6*d*. each respectively. Two tablets should be dissolved in the mouth half an hour before and two tablets half an hour after each meal, unless otherwise directed by the physician.

New Inventions.

A COMBINED ENDO-TRACHEAL PUMP AND SUCTION APPARATUS.

THE machine illustrated is an attempt to provide in one apparatus all that is necessary for any type of anæsthesia combined with really powerful suction. It has been constructed by Messrs. Coxeter and Son, Ltd., of 171–175, Pancras-road, London, N.W. 1.

The main features of the apparatus are :—

(1) It is portable, as it is fitted with a wood cover and can be carried by a strap.

(2) It is almost silent in operation. This is due to the motor and pump which are of the Reavell-Moseley type, being direct-coupled without intermediate gearing, in the same case. The rotary pattern pump is much more silent than is the oscillating type, and is almost as efficient.

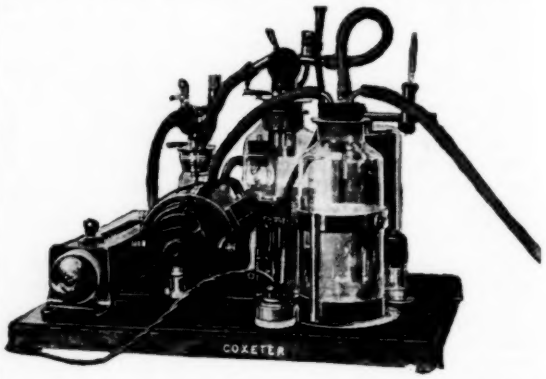
(3) It can be operated on any electric current, direct or alternating from 100–250 volts. This range covers practically every main supply in England, and is effected by employing a double wound motor.

(4) Chloroform, ether, or mixed vapours can be supplied in any proportion at any (measured) temperature and pressure, within fairly wide limits.

(5) An adjustable automatic blow-off prevents the pressure rising beyond any desired value even if the motor is run at full speed during an endo-tracheal administration to provide maximum suction. This feature is of utmost importance in combined machines.

(6) Two filters and two traps are provided between the suction and pressure systems. Furthermore, it is impossible for any liquid particles of anæsthetic to reach the exit tube, however full the bottles may be or however high the pressure.

(7) At full speed the suction is sufficient to aspirate blood clot or thick pus with ease. Thus the apparatus can be used with advantage for dissection tonsil-



lectomies, septum resections, or other proceedings where powerful suction combined with an endo-tracheal or endo-pharyngeal anæsthesia are necessary.

(8) If the necessary cylinders are available, nitrous oxide–oxygen or ethylene–oxygen can be administered.

(9) The base-plate of the heater is continued as a support for the ether bottle. Consequently the most concentrated ether vapour can be supplied indefinitely without any freezing in the bottle.

Care has been taken with all the electrical connexions to avoid any possibility of sparks coming into contact with the anæsthetic vapour. This is of vital importance when using ethylene. With nitrous-oxide, the new "dry" gas supplied by manufacturers obviates the necessity for heating the reducing valve, with additional safety from possible explosion.

Regent's Park, N.W. C. LANGTON HEWER.

A NEW INTRA-UTERINE FORCEPS.

FOR the removal of retained portions of embryo the blades of the forceps (see figure) are placed in the uterus separately by a method similar to that commonly employed for the application of midwifery forceps. By this means a substantial hold is obtained, rotation can be effected, and "nibbling" small

fragments of embryo avoided. The necessary incursions to empty the uterus are reduced to a minimum. Any compression that may be necessary is accomplished by means of the adjustable screw at the extremity of the handles, and as the blades traverse the cervix by lowering this portion of the instrument into the same plane as the handle to which it is attached, an aid to traction is obtained, the handles in the meantime being kept at the requisite degree of apposition by pressure with the left hand of the operator. The lower blade can also be used separately to remove from the uterine wall an early placenta, or other adherent material removable by gross curettage.

The instrument is made in two sizes and can be obtained from H. McClory and Son, 5, Edmund-street, Birmingham.

J. HARGREAVES ROBINSON,
Hon. Surgeon, Royal Maternity Charity of London.

THE LANCET.

LONDON: SATURDAY, AUGUST 16, 1924.

MENTAL DEFECT IN SCHOOL-CHILDREN.

THE proportion of mentally defective persons in the community is not yet a matter of complete agreement. Some estimates of this proportion have been made at different times and in different areas by more or less independent investigators, one of the most recent and most thorough being that of Dr. CYRIL BURT, psychologist to the London County Council, who found a percentage of one and a half among London school-children. The standard adopted has varied with the investigator, and data have usually been incomplete. Dr. G. K. BOWES, in a careful study of children of school age in the rural area for which he is responsible, has discovered so large a proportion of defectives as 3 per cent., and suggests that it should possibly be really 4 per cent. We print on p. 313 his method of ascertainment and some interesting descriptions of individual families. It is probable, as Dr. BOWES himself hints, that the proportion of mentally deficient persons in a rural population is greater than that in a town population, because of the fact that a lower degree of intelligence serves for self-support in a rural area; but on the other hand there appear to be some grounds for thinking that the proportion in the town areas is larger than has been generally stated hitherto. The somewhat disturbing figures suggest the necessity for considering the feasibility of attempting to make a national census of mental defectives. The social and eugenic aspects of the problem of mental deficiency are of sufficient importance to the State to justify such a census in order that the magnitude of the problem may be accurately judged. In the case of children of school age the legal provision and the machinery already exist. The terms of both the Acts of Parliament dealing with mental deficiency make it obligatory upon local authorities to discover all defective children, but it is extremely doubtful whether in any area anything like a complete census is yet available. Local authorities, in particular, who have no special school provision are apt to be slack in the performance of this duty; with others the difficulty is shortage of staff, and, it may be also, lack of experience among the staff in diagnosis of deficiency.

But legal provision and machinery are not enough. There is as yet no definitely fixed standard of what is meant by mental deficiency. Yet in this respect the position to-day is very different from what it was at the time of the Royal Commission on the subject which preceded the passing of the Mental Deficiency Act. Thanks to the efforts chiefly of an army of psychologists, we are now provided with scales of tests, intelligential and educational, which, however imperfect, are of practical value in estimating intellectual capacity, and which in their use allow of greater uniformity in the methods of examiners than was possible before their existence. It is true, of course, that diagnosis of mental deficiency cannot be made by such tests alone—if it were attempted the result would be alarming. But although we are still without generally applicable tests of character, it does not seem impossible to devise some method of "marking" certain social aspects of character, as observed in general behaviour. Dr. S. D. PORTEUS, Superintendent of Special Schools at Melbourne, has indicated the possibilities in this direction in a "social rating scale." A census with a scientific basis of this sort would be of great value. A census based merely on the working definitions of the two existing Acts of Parliament would not be adequate. The vast majority of the cases at present certified under the Mental Deficiency Act are cases of very low grade intellectually—very little higher than the idiots and imbeciles already provided for in the Lunacy Acts; these are by no means so dangerous from a eugenic point of view as many who elude certification, but make as certainly defective and undesirable as parents. At the period of the passing of the Mental Deficiency Act the eugenic aspect had to be slurred over in deference to opposition which emanated more from the heart than the head, but a census that is to be of any practical and scientific value to the nation cannot be thus influenced.

THE PLACE OF CROWNS AND BRIDGE-WORK IN MODERN DENTISTRY.

AT the annual meeting of the British Dental Association at Edinburgh, which has just concluded, Mr. H. W. BENNETTE read a paper on collar crowns in which he unsparingly condemned this method of saving teeth, and in the discussion which followed it was apparent that most of his hearers agreed with him. In considering the evolution of operative dentistry from its lowly beginnings, there are certain methods which stand out as landmarks. Amongst them the use of crowns and bridges represents a notable change in the outlook of the modern dentist. It does not require a very long professional life to have witnessed the gradual evolution of crowns and bridges to their highest point of technical achievement, and their decline in popularity to the present time when so many regard them with disfavour. This decline is not due to the substitution of other methods of greater technical efficiency, but rather to a different outlook on the aims and objects of dental surgery. Even to-day it would be premature to regard the discussion on crowns and bridges as ended, and the obituary notice as read. There are still a large number of dentists both in this country and abroad who use these methods extensively. The pages of dental journals abound in advertisements of various appliances to facilitate the construction of crowns and bridges. A new edition of a popular text-book on crowns and bridges has recently been issued and will doubtless find many purchasers. But although there exists this discrepancy between the academic teaching of dentistry and its practice in many quarters, there can be no doubt that the modern trend is definitely away from these methods of saving teeth.

The reasons which led to the introduction and decline of these operative methods are instructive. Thirty or forty years ago, when great technical advances were beginning to be made in dentistry, the aim of the dentist was to save as many teeth as possible. The local hygiene of the mouth was not entirely disregarded, but it was looked at from a narrow point of view and without much regard to the general health of the patient. Many ingenious methods for splinting loose pyorrhœic teeth were devised on the principle that all teeth which could be used without pain should be retained as long as possible. Relics of this attitude still exist, but they are fast passing away. When teeth were too carious

to be filled the method of restoring them by an artificial crown of gold or porcelain was introduced. The crown was fastened to the root either by a collar placed over the root and cemented on, or by a post passing into the root canal and secured by cement. It is obvious that, even with the highest technical skill—still more, if the crown is poorly constructed—there is a tendency for food and bacteria to collect round a device of this kind. In the case of collar crowns there is the added factor that there must be a ledge under the gum which collects debris, no matter how well constructed, and must act as an irritant to the gum and periodontal membrane. For this reason many dentists began to condemn this type of crown on the grounds that it predisposed to pyorrhœa, and was an unclean device. This feeling has been steadily growing, until there are few dentists to-day who would not agree that the collar crown is insanitary and should be abandoned. This is not to say that crowns as a whole are to be regarded as an illegitimate form of dentistry. There is still a wide field of usefulness for crowns, but with the proviso that not only must they be constructed with great accuracy, but also that the crown must fit the root edge to edge so that there is no ledge to collect debris. There has been so general a condemnation of crowns by doctors that it is well to make it clear that properly constructed, and in suitable conditions, a crown may be a perfectly scientific and hygienic method of conserving teeth. Any type of crown, however, which involves a collar fitting over the root and extending below the gum margin is, in the opinion of most dentists, a form of conservative dentistry which leads to dental sepsis and should be discarded.

With regard to bridgework, in so far as the abutments of the bridge which are placed on the supporting teeth are collar crowns, then the condemnation of such crowns applies to bridges also. But there is another factor. Each tooth is capable of slight independent movement under the stress of mastication, through the yielding of the periodontal membrane. This buffer-like action lessens the force of mastication. When two teeth are splinted together, as in a bridge, they must both move together, instead of independently, and the stress to which they are submitted will cause them to become loose. In the case of large bridges which bear a considerable amount of impact during mastication, the strain on the abutments will soon cause the loss of the supporting teeth. In the case of small bridges exposed to little or no strain, this factor may not be serious. Added to this there is also the factor of cleanliness. It is difficult to make so complex a piece of apparatus as a bridge self-cleansing. It tends to gather debris far more than a crown, and may become a veritable trap for filth, well meriting the original condemnation passed on bridges by Dr. WILLIAM HUNTER. If the bridge is removable the foregoing objection may have less weight. Such bridges call for a high degree of technical skill. They may have a legitimate place within narrow limits, but not to an extent which seriously qualifies the general distrust of bridgework as a clean method of tooth restoration. Since the advent of the X ray has shown that pulpless teeth, free from symptoms, may sometimes be infected at the apices, crowns have received additional blame. Sir WILLIAM WILLCOX, for instance, has stated that all crowns should be extracted because of the apical infection so often present. There is some confusion of thought here. It is not the presence of the crown which leads to apical infection, but rather the infection of the pulp canal consequent on the death of the pulp. Crowned teeth are usually pulpless, but there is no evidence to show they are more frequently the seat of an apical lesion than pulpless teeth which have been filled. The logical extension of such an attitude would be to state that no tooth which had not a living pulp should be retained in the mouth, and that no treatment involving the root canals should be undertaken. This view has been put forward in America by some, but it does not appear to us that the facts warrant so sweeping a statement or so drastic a limitation of conservative dentistry. The presence of apical infection in some teeth which have been treated is a wholesome challenge to the dentist, for it raises the question as to whether dental technique is sufficiently thorough and scientific to exclude infection from devitalised teeth. The dental profession is fully alive to the gravity of this issue. Already the interest aroused has resulted in a notable improvement in root canal technique which warrants the belief that in the near future infection will be eliminated with certainty in the treatment of diseased pulps.

ZOOLOGY AND MEDICINE.

THE presidential address to Section D of the British Association, delivered by Prof. F. W. GAMBLE at Toronto on August 11th, is of more than usual interest to medicine and its institutes. Taking as his title "Construction and Control in Animal Life," he brings out emphatically the change which in recent times has come over the subject which he professes. Most of last century was occupied with description and classification: "zoology" and "comparative anatomy" were more or less interchangeable terms, and the animation which followed the publication of the "Origin of Species" left the method of inquiry much the same, while it transformed the interpretation of the results. The outlook has now changed again and the dying Darwinian impetus has been replaced by the experimental method. Animals are no longer products which are, within comprehensible periods of time, finished and stable beings; the being, well-being, and becoming of them are no longer problems of statics, but of dynamics. "Regulation" is the keynote of the development of zoological knowledge, whether internally, as by the discovery of the factorial hypothesis, or externally, as in œcological relations. Form has been predominant over function in the formal discipline of zoology; it has been assumed by most people that form has determined function. But function is now coming to the front, zoology and physiology and pathology are fusing their spheres of action, and a good many are wondering whether function does not really determine form. The applications of the older zoology to medical science are obvious enough. It is impossible to investigate the functions and lives of things which have no names, and the intervention of LINNÆUS was timely. The energy spent on the nicest work in comparative systematics has never been wasted. As the master said, "nomina si nescis, perit et cognitio rerum," and he did well to insist that the live world must be arranged, identified, and put into a form as convenient and lucid as a collection of postage stamps. Every schoolboy who is taken to a museum knows that the being of Anopheles means something different from the being of Culex; the native will learn not to tie up his foreskin for fear of bilharzia when he knows enough about the systematics of snails; it seems likely that some of the most puzzling problems of the distribution and prevalence of plague in India have been solved by the elegant separation of *Xenopsylla astia* from *X. cheopis* by experts in fleas. Pathology has, too, a significant connexion with this side of zoology, through its demonstration of the species specificity of immunological relationships. The identification of a bloodstain by a precipitin reaction does something more than bring a murderer

to the gallows: it shows that a dog differs from a man in something more than his anatomical appearance. The parallelism of anatomical and immunological classifications is a field which zoologists might cultivate to advantage.

But in its newer experimental outlook zoology comes much more into relation with medicine, and physiology and pathology have a greater contribution to make to zoology. Prof. GAMBLE covers a wide field: some of his points only can be mentioned. He gives considerable attention to the remarkable work initiated by Prof. C. M. CHILD of Chicago on axial gradients. This shows that the head end of an elongated animal is different from the more posterior parts in metabolic intensity and susceptibility to poisons, and that it exerts a variable degree of dominance over the subordinate hinder end. The rate of metabolism diminishes from head to tail, and when the head becomes sufficiently functionally remote from the tail the latter may separate itself off as a new anatomical individual, as in planarians. Normally each cell of an early segmented egg develops into a certain organ or part of an organ. But there is no inevitable predestination in the business. Experimental interference with the arrangement of cells, which under natural conditions is found to be convenient, shows that what the cells of the embryo ultimately become depends much less on what they are than on where they are and how far they come under the influence of the top of the metabolic gradient. The confluence of thought between the experimental embryologist and those who study tumours and their metaplasias is striking.

Another matter in which Prof. GAMBLE finds food for zoological reflection is the quantitative relation between form and function comprised in the familiar topics of hypertrophy, reserve force, and compensation with the corollary theory that the work of an organ is achieved by its units working by rotation in shifts, thus keeping in good order for functional activity a larger quantity of tissue than is needed in ordinary existence. The relation of these ideas, which have been developed mostly by pathologists, to the biology of live animals is obvious, and we may hope that their consideration by zoologists will lead to a corresponding advance in our understanding of their pathological significance. Prof. GAMBLE also notices an outcome of factorial genetics of which the possible importance in medicine hardly seems to be realised. Breeding experiments have shown that factors are transmitted in groups, which may be presumed to be the chromosomes. Some combinations of factors, which in themselves have nothing to do with life and death, cannot be actually achieved because the individuals bearing them are not viable. Or they may be achieved under artificial conditions and never occur in nature. There are therefore lethal factors and factors which result in subnormal individuals—phenomena which may have applications to human viability and mortality of very far-reaching importance. We mention only a few examples illustrating the interest of Prof. GAMBLE'S discourse. We would commend its careful perusal to those who think it well to depress the position of biology in the medical curriculum or even eliminate it altogether.

FORMALDEHYDE IN FOOD.

AN Interim Report[1] of the Food Preservatives Committee condemns the addition of formaldehyde or any of its derivatives to food or drink. Formaldehyde was discovered in 1867 by A. W. Hofmann as a gaseous product of the flameless combustion of methyl alcohol, and it was soon manifest that the discovery was one of immense industrial importance, for by reason of its very simplicity—the formula is H·CH : O—formaldehyde was found capable of reacting with practically any class of organic, and a large number of inorganic, substances. The high solubility of the gas in water (formalin is the name given to a 40 per cent. solution) made its application technically easy. Its prodigious reactivity made it of high value in the coal-tar colour industry; in tanning it was used for making leather hard and firm; it became popular for coagulating rubber latex, for fixing glues and sizes, for waterproofing fabrics by rendering gelatin or casein insoluble, for hardening the gelatin films of photographic plates, and for preserving anatomical museum specimens. Sir Edward Thorpe's "Dictionary of Applied Chemistry," which gives an excellent précis of the industrial applications of formaldehyde, adds ominously: "It is largely used for the preserving of foodstuffs." Now it is difficult a priori to believe that any substance so renowned as a hardening reagent for all kinds of organic products can be suitably applied to food or to the tissues of the human body which is to ingest that food. The Report lays it down categorically that formaldehyde is a powerful protoplasmic poison, exerting an irritant action upon mucous membranes, causing inflammatory changes in the liver and kidneys after prolonged use, combining with tissue proteins in its passage through the body, and retarding digestion by combining with the protein constituents of food. On all these counts formaldehyde is objectionable as a preservative of food. Further than this, there is the dreadful possibility of its use to conceal incipient decomposition; the Report quotes on the authority of Sir George Buchanan a testimonial from a provision merchant attached to a circular advertising preservative containing formaldehyde, which reads as follows: "It is only right that you should know that the treatment you gave my bacon and cheese with ——— which were previously unfit for food are now saleable articles; therefore, you can supply me with a quantity convenient for my use." The addition of formaldehyde to milk is already illegal, administrative action has secured its removal from imported caviare, and the Departmental Committee on Preservatives recommended as long ago as 1901 its prohibition as an addition to any kind of food or drink. Every country which has made legal enactments or regulations regarding the purity of its food-supply has, explicitly or implicitly, prohibited the addition of formaldehyde, and the Committee appointed by Mr. Neville Chamberlain in July, 1923, has no hesitation in recommending that the addition of formaldehyde or any of its derivatives to food or drink should be absolutely and specifically prohibited.

This Committee is not yet ready to report on its wider reference of preservatives and colouring matters in food, and the sweeping condemnation of formalin has arisen on the request for a special report on the Linley process for preserving chilled beef. The Committee found it could not satisfactorily divorce the particular case from the wider question. The object of the Linley process is to enable beef chilled at a temperature of 29° to 30° F. to reach this country from the Argentine or Australasia in good condition and free from moulds. The process, according to its inventor, consists in the single application of formaldehyde gas before shipment, the amount of formalin evaporated being calculated on a basis of two-thirds of an ounce for every 100 cubic feet of space in the chilling room. For some years before the war chilled beef thus treated was imported from the Argentine, although even then the abattoirs controlled by North American firms did not adopt the process and were yet able to export chilled beef successfully. In 1909 an inquiry made by the Local Government Board resulted in an unfavourable verdict on the meat so treated, and a suggestion was made to the traders to limit the use of formaldehyde to the disinfection of the holds before introducing the meat. The amount of formalin in the treated meat was found to vary within very wide limits, and in some cases it had penetrated 30 mm. or deeper into the carcass. The Linley process ceased with the war and the chilled beef now being imported from the Argentine is carried at a

[1] Interim Report of the Food Preservatives Committee on the Treatment of Chilled Beef and Other Foods with Formaldehyde. London: H.M. Stationery Office. 2*d*.

slightly lower temperature—namely, 27° F. The reason given for desiring resumption is that under present conditions the journey from Australia is too long to permit successful transport of chilled beef to this country without the aid of the Linley process. The Committee considered whether it might not be possible to permit the use of formaldehyde after prescribing a limit for the amount which might be present, say 2 to 3 parts per million in a surface layer of beef 7 to 10 mm. thick; but they decided that control would be difficult, and that similar liberty would have to be given to meat traders in this country. On the whole they came to the conclusion that the true interests of trade would not be furthered by a revival of the practice, and it is gratifying to learn that the undesirableness of using formaldehyde as a preservative is generally recognised by the traders themselves. We are glad of this Interim Report and trust that there may be no delay in taking the step of making formaldehyde illegal in the preservation of foods and drinks.

Annotations.

"Ne quid nimis."

CHARITIES AND THE ENTERTAINMENT TAX

DURING the recent discussion on the report stage of the Finance Bill, Mr. Snowden, Chancellor of the Exchequer, proposed a new form of words for the clause providing that entertainment tax should not be charged on entertainments promoted for certain objects. While, he said, it was necessary to protect the revenue against exploitation of charities by private individuals, he thought, and the House of Commons agreed with him, that any society or institution of a permanent character, established or conducted solely or partly for philanthropic or charitable purposes (or by two or more such societies or institutions acting in combination) when devoting the whole of the net proceeds of entertainment to philanthropic or charitable purposes, should be entitled to claim repayment of the tax, but on the understanding that the whole of the expenses of the entertainment did not exceed 50 per cent. of the receipts. The concession, which is a reasonable one, is very welcome in its effect on entertainments promoted for hospitals and other medical charities.

AN ARRAIGNMENT OF THE BOBAC.

THE tarabagan or bobac is a marmot widely distributed over the uplands of Eastern Siberia and Northern China. In appearance it resembles the bland, inoffensive rodent familiar to all climbers in the European alps, and in America under the name of woodchuck. Nothing except a noisy whistle and an undue appetite for succulent vegetables has been urged against the European and American members of the genus Arctomys, but evidence is now conclusive to incriminate the Asiatic bobac as the carrier of pneumonic plague. This has long been suspected, an early writer on the subject being Dr. M. T. Schreiber, whose article in the Russian *Vratch* of 1907 was published shortly before he himself died of the disease in the Government laboratory near Petrograd. A number of outbreaks in the tarabagan were recorded in his paper, as well as the fact that epizoötics occurred among these beasts without, as he believed, human beings becoming infected. In 1910–11 a medical commission, under the leadership of Prof. Metchnikoff, went out to investigate fatal cases of pneumonic plague then occurring on the Khirgiz steppes, where the place of the bobac is taken by another species of Arctomys known in Russia as the süslik. The susliks were not found to harbour fleas, although commonly enough a small tick was lodged behind the ear. Next, as a result of the International Plague Conference held in Mukden in April, 1911, the Chinese Government instituted in North Manchuria a plague prevention service under the directorship of Dr. Wu Lien Teh, whose report, read at the International Congress of Medicine in 1913, appeared in extenso in our columns.[1] On the evidence then available Dr. Teh satisfied himself that though the bobac does occasionally suffer from plague, the epizoötic was never extensive and the animal does not play nearly so important a rôle in the spread of plague as did the rat. He considered, indeed, its direct relationship to human plague as negligible, the tarabagan, fortunately, eschewing domesticity. We have just received[2] Volume IV. of the series of reports, in which Dr. Teh returns to the matter of pneumonic plague in relation to the tarabagan and revises his conclusions. Previous observations upon the tarabagan have been made rather by native hunters than by trained medical men, for the Tartars, he says, from the time of Marco Polo have described this beast under the name of Pharaoh's mouse. Hasty deductions may readily be made: the tarabagan often has a deposit of fat in the axilla which is apt to be mistaken, even by practised observers, for the characteristics of pest; unsteadiness of gait hastily regarded as due to plague has now been noted in tarabagans dying of other diseases. Dr. Teh is definitely prepared to state that sporadic outbreaks of plague occurring almost yearly in Transbaikalia, and which on two occasions (1910–11 and 1920–21) invaded Manchuria, causing the death of 60,000 and 9600 persons respectively, do actually owe their origin to the tarabagan. Other rodents are encountered in the country, but no case of human infection has ever been traced to them. The disease exists naturally among tarabagans in both acute and chronic forms and can be produced experimentally in both forms. Attempts to infect animals by ecto-parasites—flies, lice, and ticks—have failed, a prominent difficulty lying in the fact that the tarabagan is no passive laboratory animal, but a strong and vicious creature. In infected animals an acute pneumonic process is quite a common post-mortem finding. Although naturally herbivorous, the tarabagan is apt to devour the carcasses of its mates, and positive transmission has been recorded by this means. Three out of 18 cases showed a chronic or subacute condition with greyish nodules in spleen, lungs, and liver. Dr. Teh considers four possible routes in the transmission of plague from tarabagan to man. Russian observers have long believed that plague in Siberia is caused by the eating of tarabagan flesh, but there is no scientific evidence in support of this view. The possibility of infection from inhalation is remote, for the animal is either shot or trapped, and the hunter is seldom if ever in close contact with the beast in an enclosed space. But hunters do not use gloves; their hands are often chipped, and during skinning operations the plague bacillus may readily gain entrance directly into the circulation through the open wound. There are many records of such infections. Indirect transmission by ecto-parasites from a naturally infected tarabagan has not been yet observed, although Dr. Teh regards it as quite conceivable in view of the cognate work upon the rat-flea in India. Dr. Teh may be regarded as having finally convicted the tarabagan or bobac of being a carrier of pneumonic plague.

THE HANDLING OF MILK.

THE production of clean milk has now been widely recognised as one of the most important factors in a healthy food-supply for the nation, and during the past ten years it is largely to this end that the work of the National Institute for Research in Dairying at Reading (see THE LANCET, July 26th, p. 173) has been directed. The question of clean milk—granted, of course, that the animals are free from

[1] THE LANCET, 1913, ii., 529.

[2] North Manchurian Plague Prevention Service. Reports 1923–24. Pp. 314, with map, coloured plate, and micro-photographs. Tientsin Press, Ltd. 1924.

disease—is almost entirely a matter of scientific handling of the product between cow and consumer, and this point is well illustrated in a monograph issued by the Ministry of Agriculture and Fisheries,[1] in which Dr. Stenhouse Williams, of the Research Institute, gives the result of investigation into this problem. During 1916–17 an inquiry into the sources of loss in the milk trade was carried out, and it was found in examining the conditions of supply in two widely separated districts that the chief sources of loss were (1) from milk turning sour before it could be distributed, (2) from splashing in the churns, and (3) from irregularity of supply and demand. Out of a total of 165,000,000 gallons supplied annually by the two districts under examination, the loss due to sour milk was 3,615,441 gallons, representing the large sum of £180,772. The effect of this financial loss is naturally to increase the price of milk to the consumer, and further, there is a very serious wastage of valuable foodstuff. Thus the handling of milk had to be considered in a threefold aspect of bacteriology, mechanics, and economics. In consideration of the first aspect, which involves the keeping qualities of the milk, a comparative series of tests were made in 1916 between the cleanest commercial milk procurable and the average milk from a better class farm. Samples were examined for bacteriological condition and duration of sweetness from the two types of farms. The results showed that where the milk was produced under conditions of strict cleanliness and was cooled immediately it came from the cow to a temperature varying between 45° and 62° F., under all subsequent conditions of temperature the bacteriological counts only rose above 10,000 per 1 c.cm. on three occasions in the course of two years. The average milk, which was sometimes cooled and sometimes not, showed a very different and variable picture. Dr. Stenhouse Williams writes: "It was a revelation that milk which had been properly handled at the farm could maintain so uniform a standard of cleanliness at the end of 24 hours." It was found that clean milk could remain sweet in a cool cellar for an average of 5·8 days, while ordinary milk turned sour after an average of 3·75 days. This question of keeping qualities is one of the greatest importance, as the milk which remains sweet longest is the more marketable commodity. Experience at Reading showed that the poor were willing to buy Grade A (tuberculin-tested) milk, chiefly because its keeping qualities were so much better than that of the milk to which they had been accustomed. There is no surer way of touching the public conscience than through the pocket. If, therefore, clean milk is synonymous with cheaper milk, then we may hope for enthusiasm in the spread of modern hygienic methods in dairying.

THE HOUR OF BIRTH.

IT is an almost universal belief among doctors and midwives that more infants are born by night than by day. Doubtless this belief depends to a large extent on a trick of the memory; we are much more likely to remember an event if it occurred in the night and robbed us of our sleep than if it occurred by day and was one of many thronging incidents following each other with kinematographic speed. To substitute facts for impressions, Dr. O. A. Boije[2] of Helsingfors has recently carried out investigations at his maternity hospital, where he has found that the number of births between 6 in the morning and 6 in the evening was almost exactly the same as the number in the other 12 hours of the 24. His material consisted of 7751 confinements, all of which were terminated spontaneously. There were 3887 in the 12 hours of the day, between 6 A.M. and 6 P.M., and 3864 in the 12 hours of the night. The 24 hours were further subdivided into eight divisions, each of three hours, the divisions being from 6 to 9 in the morning, and so on. The graphic representation of the number of births in each of these eight divisions ran as an almost horizontal line, the difference between the greatest number of births (1059 between 6 and 9 A.M.) and the smallest number (905 between 12 midday and 3 P.M.) being comparatively slight. It has often been taught by the textbooks that the hours from midnight to 3 A.M. are those in which a greater number of births are crowded than in any other three-hour period. But in Dr. Boije's material there were only 1018 in this three-hour period of the night. Turning to the hours at which the regular onset of labour begins most frequently, he finds much greater difference than in the case of the completion of labour. The 24 hours of the day being again classified in eight three-hour intervals, it was found that only in 6·5 per cent. of the total did regular labour-pains begin between 12 midday and 3 P.M. From 3 P.M. there was a continuous rise for every three-hour period up to 3 A.M., the maximum being reached in the period 12 midnight to 3 A.M. As great a proportion as 19·6 per cent. of all the labours began at this hour of the night. Almost twice as many labours began during the 12 hours of the night as during the 12 hours of the day, the actual figures being 5084 and 2658 respectively. It would seem that in Finland, at any rate, when labour begins at night, it is usual for a hasty departure to be made to a maternity hospital; whereas when labour begins during the day the departure for a maternity hospital is less precipitate. Consequently many more maternity cases enter hospital by night than by day.

It would seem that, though labour is as often terminated by day as by night, doctors and midwives are more likely to be called on by night than by day to attend confinements.

[1] Studies concerning the Handling of Milk. Miscellaneous Publications, No. 41. London: Ministry of Agriculture and Fisheries, 10, Whitehall-place, S.W. 1. 1924.

[2] Finska Läkaresällskapets Handlingar. May–June, 1924.

ANKYLOSTOMIASIS IN THE ARGENTINE.

IN a recent article in *La Semana Médica* Dr. Vaccarezza, Chef de Clinique for Prof. Destefano, deals very fully with the whole question of ankylostomiasis in the Argentine. The disease is widely spread in the north of the country, particularly the province of Corrientes, so much so that 40 per cent. of the recruits from that region show evidence of it on fæcal examination. In some localities practically all the inhabitants are infected. The disease is frequently contracted in infancy, often with very grave results, but after that it is apt to pass unnoticed till adolescence, when the maximum incidence occurs. The blood shows more or less deficiency of red cells, according to the severity, with excess of eosinophiles and often some slight excess of leucocytes. *Necator americanus* is far the most frequent parasite, associated in a large proportion of cases with trichocephalus and others. Dr. Vaccarezza states definitely that the most successful treatment is by carbon tetrachloride in doses of 3 c.cm. for adults; one dose suffices in the majority of cases. If this drug is contra-indicated or fails, the essential oil of chenopodium is the next best; both, he adds, are safer than thymol. As preventive measures the construction of latrines and the use of adequate foot covering are regarded as the most important. The article contains a bibliography of recent Spanish literature on the subject.

CHANGES IN THE COMPOSITION OF THE URINE AFTER MUSCULAR EXERCISE.

THE studies of D. Wright Wilson and some of his colleagues on changes in the composition of the urine after exercise[1] are worthy of record. The effect of short periods of strenuous exercise on the urine was studied by comparing the urine from normal men in a resting condition, collected in ten-minute

[1] Proc. Soc. Exp. Biol. and Med., vol. xxi., May, 1924.

periods, and then, after exercise in running up and down stairs had been introduced, making further collections of urine. The object of the investigation was to learn the rapidity and extent of the response of the kidney to the chemical and physical changes taking place in the organism. There was a marked fall in the urine volume after exercise which could not be overcome by drinking small quantities of water at frequent intervals. A considerable increase in the excretion of acids and the conservation of bases were demonstrated by the rapid increase in the hydrogen-ion concentration, titratable acidity, ammonia, and ratio of ammonia to total nitrogen of the urine. The inorganic phosphates increased in parallel degree to the acid excretion. The values reached a maximum in 20 minutes, and returned to normal in less than an hour. The hydrogen-ion concentration frequently returned to normal more slowly, and the phosphate excretion always fell below normal toward the end of the experiment. There was a marked fall in the chlorides, which apparently was not due to the decreased fluid output or to loss of chlorides in the perspiration. The excretion of chlorides fell to a minimum in 20 minutes after exercise and then returned to normal. There was a considerable fall in the nitrogen excretion, but no characteristic change in creatinine due to exercise. The changes observed in the composition of the urine, when compared with the variations in the composition of the blood observed by Barr and his collaborators, indicate that the kidney responds rapidly and efficiently to aid the neutrality regulation in the body. By similar collections of urine in ten-minute periods in men, the excretion of lactic acid after exercise was determined by Clausen's method. After one or two minutes' strenuous exercise the lactic acid excretion rose from a normal of about 2 mg. in ten minutes to 150 mg. in ten minutes. The excretion reached a maximum within 20 minutes after exercise, and then fell rapidly. There was a return to normal in about one hour.

AYURVEDA.

WE have received a copy of the first issue of the *Journal of Ayurveda*, a monthly periodical published in Calcutta and edited by a Sanscrit scholar who was trained initially in the Western system of medicine. A readable and modest paper on the aims and ideals of Ayurveda by Capt. G. Srinivasa Murti, I.M.S., is followed by a speculative essay on the place of bacteria in the Oriental scheme of medicine. We have next an article on the therapeutics of mica and its medicinal preparations, and material is here supplied for an inquiry by Western pharmacologists. A short history of the Ayurvedic system and a note on its renaissance conclude an interesting journal, to which is appended a report on the Fourteenth Ayurvedic Conference, held at Colombo last April. This magazine forms a curious contrast to such publications as the modernised "Charaka Sambita" and the "Ayurvedic System of Medicine," both published in English a few years ago, in which extravagant claims were put forward for Ayurveda, joined with stupid denunciations of Western medicine. This active hostility to Western medicine alienated the sympathy that the traditional therapy would have received from progressive Western medicine, but now that Ayurvedic medicine is working to use the advances made by modern science it should receive from the West open-minded treatment. Two potent stimuli have recently energised Ayurveda: the Reforms Scheme, and a newly-aroused desire on the part of I.M.S. administrative officers and others to put the system through a full scrutiny. Two inquiries have been held: one by the Government of Madras, the report on which has just been published and is highly interesting and instructive; the other by the Government of Bengal, the report on which is impatiently awaited. The greatest modern champion of modern Ayurveda was the late Sir Pardey Lukis, who, years ago, thought that modern Ayurvedic practice might come to hold an important place in the medical work of India. Medical administration is now a transferred subject, and Indian ministers holding this portfolio in the Provinces have not been slow to foster the indigenous systems of medicine. Allotments have already been made by some Provincial Governments to promote the extension of Ayurveda, for which colleges, hospitals, and dispensaries are being opened in many parts of India. There are over a hundred millions of people in India who cannot get Western medical treatment, and there are many millions who suffer and die without receiving medical care of any kind. The country is so vast that Government is unable to provide for the medical treatment of everyone. We welcome the prospect that many of these unfortunates will be within reach of modern Ayurvedic practitioners and that they will have something beyond charms and incantations to rely upon. For these and other reasons we hope the indigenous system of medicine will receive further encouragement.

THE TEACHING OF HEALTH IN SCHOOLS.

WE had occasion in our issue of August 2nd to notice the booklet on "The Practice of Health" issued under the auspices of the Headmasters' Conference as framing the teaching of a subject of the first importance along lines which were impracticably generous. The matter is dealt with again by Dr. H. O. West, of Margate, in the *Preparatory Schools Review* (June, 1924, p. 53). Enthusiastically in favour of some such regular instruction, he urges that it must be of the simplest character and limited to elementary essentials which are within easy comprehension. A syllabus does not define the standard to which a subject shall be taught, but the one he proposes seems to omit nothing of importance, and is as follows:—

1. The romance of public health. Bygone days, famous names, present opportunity.
2. The air we breathe. Composition, impurities, ventilation.
3. The water we drink. Sources, purity, impure water and disease.
4. The food we eat. Different kinds, use and abuse.
5. The sunlight we need. Rays and their properties.
6. The houses we live in. Garden cities, overcrowding.
7. The refuse we get rid of. Various methods, drainage.
8. The bodies we have. Unity of life, cells and their functions, rest and exercise.
9. The germs we use and those we suffer from. Infection and disinfection, immunity.
10. The diseases we can defeat. Causes, methods, epidemics.
11. The generation to follow. Practical application.

Applied with a sensible discretion, this should be a satisfactory general guide. He also suggests that some, at any rate, of the instruction might be given by the school medical officer rather than the masters, and that a certain amount of hygiene might be incorporated into the literary and historical studies of the pupils. Healthiness and history have not been studied together as they might have been, and there is no doubt that, for example, plague in England from 1348-1667 and the falling death-rate of the nineteenth century are historical factors which have to be taken into serious account in any attempt to understand what went on in these periods. Such a method of treatment also reduces the danger of teaching children to make too much of their personal healthiness; as such a quest per se is hardly an ideal of the highest order.

THE AMERICAN MEDICAL WAR SERVICES.

WHEN if ever the time comes for a general mobilisation of the fighting forces in the United States of America half a million men will be immediately required for the care of the sick in the armies and hospitals. Surgeon-General M. W. Ireland lays down [1]

[1] The Military Surgeon, July, 1924.

the urgent duties of the medical corps in a general mobilisation as (1) to protect the interests of the country in the medical examination of reservists (a duty at first requiring many medical officers, who are soon available for service elsewhere), (2) to protect the health of the new forces, and (3) to prepare vaccines on the scale required. On the mobilising day the war department will tell the medical department the total force aimed at, and the time allowed for mobilisation—the standard idea being four million men in one year. Hospitals must be quickly ready, for 5 per cent. of the reservists will want hospital treatment at once. Three-quarters of the medical corps, or about half a million in all, will be wanted for the care of the sick. Sanitation is, primarily, the responsibility of the local commander, but technical experts must be provided by the medical corps at once; and the number required will tend to increase as the war goes on. So urgent are the calls of medicine on mobilisation that the war department gives priority to medical personnel over the combatant services, and 15,000 medical men will be required at once, while 20,000 will be called up later, leaving one doctor to 1300 of population. Nurses will be left in about the same proportion. Medical men will be called up not individually, but in units. Next in importance to personnel is material; lists of all equipment for all varieties of service are being completed, and the difficult question of replacement is being faced. Replacement will at first be carried out from the reservists, but there are highly skilled technical experts who will advise the department in war time as to where supplies are to be obtained. Some demands have already been assigned by the Assistant Secretary of War to particular districts. Organisation will be improved by the fact that all the newly passed army medical students were educated in the one school, which, for a quarter of a century, it had been the aim of the medical corps to provide—a school having hospital, museum, and library within the same ring fence, and designed to become in time a noble centre of medical learning.

NEPHRECTOMY IN BILATERAL RENAL TUBERCULOSIS.

A FEW years ago most surgeons would have refused to perform nephrectomy where both kidneys were tuberculous, perhaps they would do so even now. But a good case has recently been made out for removing the most diseased kidney, and the advocate of this course, Prof. G. Ekehorn,[1] of Stockholm, speaks with an experience of about 200 cases of renal tuberculosis coming to operation. It is encouraging to find that renal tuberculosis is, on the whole, seen by the surgeon in an earlier stage than heretofore, and Prof. Ekehorn has observed an appreciable diminution during the last few years in the number of patients coming to him in an advanced stage of renal tuberculosis. But he has seen as many as 27 cases in which the disease was so advanced that he could not carry out all the usual tests, and in five cases not only was catheterisation of the ureters impossible, but he could not even examine the bladder by cystoscopy. The fate of such cases is usually expectant treatment. The course adopted by Prof. Ekehorn was more active; the kidney thought to be least damaged was explored by an operation, and when not found to be too extensively damaged, the more diseased kidney on the other side was removed. In seven cases the operation was confined to exploratory exposure of the kidneys. In the remaining 20 cases the most diseased kidney was removed, the disease having completely, or almost completely, destroyed the kidney in 11 cases and having damaged it extensively in the remaining nine. The wounds on both sides were usually closed completely and without drainage, and though the operations were performed on the same occasion, the patients tolerated them satisfactorily, and in almost every case were better afterwards, as shown by diminution of the bladder symptoms and of the pus in the urine. Indeed, two of the patients were discharged as "well." These patients were operated on in Upsala and Stockholm between 1910 and 1922, and with a view to ascertaining their subsequent fate Prof. Ekehorn addressed inquiries to them in the autumn of 1922. He obtained no answers from five of the 20 on whom nephrectomy had been performed, and he found that ten other patients had died. One of them had lived for six years, another for two, and a third for a year and ten months after the operation. Five were still alive, and two of them were still able to do heavy work, although 12 years had elapsed since nephrectomy had been performed. They had to pass water more than once during the night, but they had no pain or other symptoms, and the urine contained no albumin. A third patient, operated on five years earlier, still had a trace of albumin in the urine and micturated frequently, but he had no pain and could work as before. It is on the strength of evidence such as this that Prof. Ekehorn favours nephrectomy in bilateral renal tuberculosis, when there is clear evidence that the most diseased kidney is largely responsible for fever, pain, and other symptoms.

[1] Hygiea, June 15th and 30th, 1924.

THE BRITISH DENTAL HOSPITAL.

WE have before us the twelfth annual report of the British Dentists' Hospital (offices, 31, Camden-road, London, N.W. 1), which was founded in 1911 to assist the large class of persons who, while possessing limited means, are unable to pay the ordinary charges of dental surgeons in private practice. At the next annual meeting the name of the hospital will be changed to the British Dental Hospital, which indeed seems desirable, inasmuch as the beneficiaries under the scheme are not the dentists themselves, who act in a purely honorary capacity, but the very large number of patients who are benefiting from the scheme. Small fees on a regular scale are charged for every service rendered, with the result that the hospital pays its way, and the whole work is done not by students but by qualified dental surgeons, numbering at present 37, who must also be members of the British Dental Association. From the outset the work of the hospital has constantly expanded, branch centres have been established taking over the dental work of various official bodies such as that of insurance committees and child welfare centres, tuberculosis patients under the Ministry of Health, and London County Council school-children. Special equipment is maintained for the service of tuberculous patients in the clinics at Battersea, Greenwich, Hampstead, Holborn, Lewisham, Paddington and Wandsworth. At Battersea the increase of patients from maternity and child welfare centres has necessitated an additional half-day a week at the clinic. In Shoreditch a dental clinic has been established at the borough council's new model welfare centre. In the case of one approved society, 50 per cent. of the male membership now has the opportunity of obtaining dental treatment from the hospital. Unfortunately the expense of dentures seriously restricts the supply to mothers from maternity centres, who stand so much in need of them. Prevention stands high among the aims of the hospital, and the staff, besides practising conservative treatment wheresoever practicable, instructs patients in such ways of life as will ensure the least amount of dental disease in the future. At the treatment centres and clinics during 1923 nearly 1900 sessions were held, with a total of over 17,000 attendances and more than 19,000 extractions. There were 3153 fillings, 652 scalings, 1337 dentures supplied or repaired, 3107 cases of advice given, and 706 dressings and root treatments. With these figures, obviously prevention is still in its infancy, and the hospital may be regarded as a plucky and successful attempt to supply part of a great national need.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LXXXIV.—THE TREATMENT OF PSORIASIS.

UNFORTUNATELY the treatment of psoriasis is still in a very unsatisfactory position. Probably no great progress will be made till the cause of the disease is known. In many cases the eruption can be removed, if not permanently, at least for some years. In the bad cases, which relapse almost immediately after treatment is stopped, one can only hope to ameliorate the condition without curing it. The treatment may be either external or internal.

External Treatment.

This varies according as the eruption is spreading or stationary. If the eruption is spreading rapidly, is itchy, and shows numerous small recent spots, rest in bed is almost essential. If the patient goes about, the rubbing of the clothes and alterations in temperature tend to increase the spread. Rest in bed slows down the circulation and keeps the skin at an even temperature. All strong applications should be avoided. There is a great temptation to apply some strong ointment to check the eruption; but this never succeeds and simply leads to a further spread. The only way is to soothe the skin till the eruption stops spreading, and not till then is the actual cure begun. An ordinary warm bath should be given daily, and the scales washed off with plain soap and water. If the case is not too acute sulphur baths (potassa sulphurata ℥ii or a packet of sulphaqua to each bath) are often very beneficial. Night and morning plain vaseline or an ointment of 5 parts of soft paraffin and 1 part of hard paraffin should be rubbed in. After a week or ten days the eruption ceases to spread. The baths should be continued, but in place of the vaseline the following ointment should be used: ℞ sulph. præcip. and ac. salicyl aa gr. iiss, lanolin and vaseline aa ℥ss. This is continued as long as there is an improvement. As soon as the improvement ceases the sulphur and salicylic acid are increased to gr. 5 to ℥i (i.e., 1 per cent.), and later to gr. 10 to ℥i (2 per cent.). Finally crude coal tar, painted on very thinly with a stiff brush, should be applied to one area, and allowed to dry on and remain on for 24 hours. If no irritation is caused, the tar should be applied to all the other areas in rotation, doing the arms on the first day, the legs on the second, the front of the body on the third, and so on, taking about five days to paint all the spots. Each spot in this way gets tar for one day and the 2 per cent. sulphur salicylic ointment for the other four days. As the eruption becomes paler the tar should be painted on every fourth day, then every third day, every second day, and finally, when there are only a few spots left, every day. The patient should be kept in bed till the tar is found to be suiting the skin. In men, if the hair is cut short, the scalp can be tarred like the rest of the skin. The tar washes off easily if any grease such as the sulphur salicylic ointment is applied. Wood tars, such as ol. cadini, are not so efficacious as the crude coal tar, besides having the great disadvantage of the strong smell. Cases after treatment with crude coal tar, if thoroughly done, are much less liable to relapse than after any other form of local treatment. The course of treatment takes from eight to ten weeks to effect a cure.

In cases where the psoriasis is extensive but no longer spreading the same treatment should be applied, beginning with the 1 per cent. sulph. salicylic ointment and going on rapidly to the stronger ointment and tar. Chrysarobin ointment is only useful in stationary cases, and should never be used if the eruption is itchy or spreading. It is not suitable for ambulatory cases. When it is used, it should be continued till the spots, which at first turn white, are beginning to show a pink colour again. After the chrysarobin treatment the case should be treated with crude coal tar to prevent recurrences. In many stubborn cases X rays will be found very useful. They should be applied once a fortnight in doses of one-half Sabouraud pastille at a distance of 15 cm. from the centre of the tube. With an ordinary gas tube the exposure is about seven to eight minutes. Usually two applications are sufficient to cause a marked improvement. The rays are especially useful when the eruption affects areas where it is difficult to get ointments into the lesions, such as on the palms and soles and the scalp. When applied to the scalp the dose is not sufficient to bring the hair out. It must be remembered, however, that the eruption does not stay away for any length of time after X rays. The ordinary local treatment must be applied at the same time. Whatever form of local treatment is applied it must be thorough. The scalp must be specially attended to as the disease is frequently left incompletely cured in that area. Unless every spot of disease is removed one cannot hope to prevent a recurrence.

Internal Treatment.

Drugs as a rule are rather unsatisfactory. Arsenic should be tried as Fowler's solution ♏ 5 t.i.d., but is only useful in stationary cases. Larger doses than ♏ 5 are useless, because if the arsenic is pushed till the patient is ill from it the psoriasis will improve temporarily, just as it does if the patient takes any acute illness such as pneumonia. As soon as the patient recovers from the arsenic the eruption recurs. The same remarks apply to thyroid extract. If a result cannot be obtained with small doses no permanent effect will be produced by large doses. The newer arsenical preparations of the arsenobenzol group have been tried, but the results obtained were disappointing. In spreading cases and also in chronic cases salicin gr. 10 t.i.d. is much more likely to do good than arsenic. Alkalies such as pot. citrat. gr. 15, together with mag. carb. gr. 5 t.i.d., are also sometimes useful. The reason for giving alkalies is based on the theory that in psoriasis the skin is too acid. From analogy with seborrhœic conditions, which are somewhat allied to psoriasis, there is some evidence that the skin is more acid than normal. The acne bacillus, which many believe to be identical with the seborrhœa bacillus, will only grow outside the body in an acid medium. Assuming that the skin is more acid than normal in psoriasis, that would explain why some individuals get psoriasis, and others, with less acid skins, do not. It is possible that in psoriasis there is a bowel infection with fermentation and the production of acid. Dieting should be tried in all cases. Psoriasis is certainly not due to any particular food, but good results may sometimes be obtained by cutting out or cutting down certain groups of foods, such as sugars, starches, meats, fats, and acid fruits. Each group should be cut down to the minimum in rotation. If an improvement is going to take place it will show itself within ten days or so. If this form of dieting produces no results, sending the patient to one of the spas, such as Harrogate, to get the bowel thoroughly cleared out does good in some cases. Drinking the waters alone is not usually sufficient; the lower bowel should be washed out by the Plombières douche. Vaccines made from the bowel contents have also been tried, but the results are usually disappointing.

Non-specific Protein Therapy.—In cases where all the above methods fail to give relief non-specific protein therapy may be tried. For this purpose sera, peptone, and sterilised milk have been chiefly used. Of the three, sterilised milk is the one to be recommended. If a foreign serum is used, such as horse serum, there is always the risk, although perhaps not a very great one, of anaphylactic shock reactions, and if the patient's own serum is used there is the difficulty of the technique which is

necessary to prepare the serum. It is difficult in practice to defibrinate the blood, centrifuge it, and keep it sterile. Intravenous injections of sterile peptone are more easily given, but I have never seen any benefit from their use in psoriasis. Intramuscular injections of sterilised milk are easily given and with ordinary care there is no risk. Ordinary fresh cow's milk is used. The milk should be as fresh as possible because, if kept for some hours, the growth of organisms in it produces toxic substances, which cause a marked rise of temperature after the injection. The injections should be given in the forenoon, and that morning's milk should be used. About half a pint of milk, together with a teaspoon, is placed in a small jam-jar, which in turn is placed in a pan containing water. The water is boiled for 15 minutes. The jar is removed from the pan and the "scum" removed from the top of the milk with the teaspoon. Some of the milk is then drawn up into a sterilised Record syringe, and injected with a long needle deeply into the gluteal muscle in the same way as the insoluble salts of mercury are given in the treatment of syphilis. Injections should be given twice a week, and not at longer intervals, so as to prevent any risk of sensitising the patient to the milk. For an adult the first dose should be 2·5 c.cm., the second 5 c.cm., the third 7·5 c.cm., and the fourth 10 c.cm., followed by two more injections of the same dose. Children should have 1 c.cm., 2 c.cm., 3 c.cm., and 5 c.cm. successively. Six injections should give the desired result. There is no object in giving more. Each injection is followed in two to three hours by a marked leucocytosis of the blood, and in three to four hours there may be a rise of temperature, usually to 100°–101° F. The temperature only remains up a few hours, and is not essential for the production of results. The leucocytosis seems to be the essential factor. The fresher the milk the less likelihood is there of any marked rise of temperature. If the temperature reaction is very noticeable the dose of the next injection should not be increased. The only risk connected with the injections is the possibility of the milk being injected direct into a vein and fat emboli being produced. This can be avoided if the piston of the syringe is slightly withdrawn before injecting the milk. If no blood enters the syringe, then it is safe to give the injection. If blood does appear in the syringe it is best to withdraw the needle, empty the syringe, and refill it with milk, and inject in another place. Injections should be given into each buttock alternately.

The above method has only an indirect effect on the psoriasis, and should always be accompanied by local treatment as well. When local treatment is applied it is much more efficacious and rapid in its action than it would be had no injection been given. If chrysarobin ointment is used the same effect is produced in a few days as would have taken three to four weeks in the ordinary course. Similarly tar and other applications act very much more rapidly than usual.

Finally, there is another factor which should never be forgotten in the treatment of psoriasis. The taking of alcohol in any form, even in small quantities, such as in light beers, &c., nullifies the effect of any kind of treatment.

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INDEX TO "THE LANCET," VOL. I., 1924.

THE Index and Title-page to Vol. I., 1924, which was completed with the issue of June 28th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers wishing to receive the Indexes regularly as published should indicate this desire.

Special Articles.

THE INFLUENCE OF FOG ON MORTALITY FROM RESPIRATORY DISEASES.

BY W. T. RUSSELL,
CHIEF STATISTICAL CLERK, NATIONAL INSTITUTE FOR MEDICAL RESEARCH.

(*Communicated by* DR. JOHN BROWNLEE.)

THERE has been much conjecture as to the influence of fog in the causation of deaths from respiratory disease, but so far as I know the analysis of the subject has never been placed on a quantitative basis. Regarding the conditions which produce the city fog, it is generally admitted that the emission of smoke from the chimney of the factory and the home is an important factor. This pollution of the air has been frequently the subject of discussion. Years ago, Evelyn, one of the founders of the Royal Society, endeavoured to focus public opinion on London smoke, which he satirically described as the "hellish and dismal cloud of sea-coal which maketh the City of London resemble the suburbs of Hell," and to counteract its evils suggested "the plantation of pleasantly odorous trees." The late Dr. Russell, of Glasgow, wrote a strong condemnation of smoke and its ill-effects, and the passage deserves reproduction in its entirety.

"Whenever the scavenging of the air is interrupted by calms, so that smoke products accumulate, the atmosphere of our streets thickens and daylight becomes twilight. If a slight wind shifts so as to fold over and double the coverlid of smoke, then at mid-day we have mid-night. Smoke not only loads fog with impurities but tends to produce fog. When, therefore, in the winter we happen upon a low temperature, a high barometer and a dead calm, we have an arctic night with a mephitic, irresponsible atmosphere in which we move about choking, our eyes irritated, our faces grimy—'a purblind race of miserable men.' It is then that our pulmonary mortality is run up, and the death-rate of the year determined."

In recent years, the researches of Prof. Leonard Hill deserve special attention. He has repeatedly drawn attention to the damage caused by smoke and fog in their obstruction of the antiseptic sunlight, and has pointed out that in London "for a period between Jan. 24th and Feb. 7th, 1880, the death-rate rose from 27 to 48, and in 1892, after a fortnight of fog, it rose to 42."

Fog as a Factor in Respiratory Death-rate in Glasgow.

In a paper read before the Sanitary Association of Scotland, Councillor Smith, of Glasgow, gave a very interesting account of the manner in which fog in the winter of 1909 increased the number of weekly deaths from respiratory disease in Glasgow. The effects were very well defined, as will be seen from Table I.

TABLE I.

Week ending—	No. of deaths.	Temperature.	Weather conditions.
Oct. weekly average	35	49·2	Clear to dull.
Nov. 6th	61	45·0	Three days fog.
,, 13th	75	44·0	Dull, slight fog.
,, 20th	138	30·7	Five days dense fog.
,, 27th	233	40·3	Hazy.
Dec. 4th	171	42·3	Hazy or wet.
,, 11th	198	37·0	Four days fog.
,, 18th	137	38·5	Slight haze.
,, 25th	95	31·9	Slight fog and clear.
Jan. 1st	93	43·1	Wet or clear.

It will be observed, however, that the statistics refer only to a particular year, and this limitation in the data must place a reservation on accepting the conclusions until the results of a series of years have

been analysed. Such is the object of the present paper.

Conditions of the Investigation.

For the purpose of the investigation, the area selected was that comprising the boroughs of Islington and St. Pancras, which contain in the aggregate a population of about 500,000 people. These districts are contiguous to Camden-square where the observations on fog were made, and they may also be regarded as experiencing the same weather conditions as the Regent's Park area, a good illustration of a fog-bound locality. The registers containing the fog and other weather records were deposited in the offices of the Royal Meteorological Society and access was kindly given to them. The records taken at 9 A.M. and 9 P.M. each day, together with the explanatory notes which described more fully the weather conditions prevailing throughout the day were abstracted from the registers for the six months, Oct. 1st to March 31st. It was deemed advisable to limit the investigation to the winter months as this is the period of the year when fog is usually prevalent. The records were extracted for a period of 30 years, but the data of only 27 years were utilised in the analysis owing to the fact that influenza became epidemic after 1890, and between that year and 1900 there were three outbursts—viz., 1892, 1894, and 1899. Accordingly, the excess number of respiratory deaths occurring in those years could not be differentiated from the complications arising out of the epidemics. For this reason these years were omitted. When the abstractions were completed the records were classified. Where it was stated that fog prevailed at 9 A.M. and at 9 P.M. and the explanatory notes indicated fog present throughout the day, the amount of fog for that particular day was represented by 100. Fog in the morning and lasting until noon was standardised as 50, due regard being given to the duration and intensity. A series of comparative figures of the daily amount of fog were thus obtained. The totals for the days were summed for each week and the sum taken as representing the amount of the fog during the week. These assessments can only be regarded as approximations, but they probably stand for a fair representation of the facts. The daily readings of temperature and rainfall were also taken out and reduced to weeks.

By the kindness of the Registrar-General, the registers containing the daily deaths occurring in the two boroughs for the period in question were placed at my disposal, and from them the respiratory deaths among children aged 0–5 years, and among adults aged 55 years and upwards, were extracted and tabulated in weeks. The analysis was confined to these periods of life as the mortality occurring at these ages embraces 70 per cent. of the total deaths from respiratory diseases. All deaths among children that could be regarded as complications of an infectious disease were excluded. A correction was then made for increase of population. This correction was most essential from a correlation standpoint, as otherwise, towards the end of the period under review, there would be a large number of weekly deaths as compared with those of the early years which would be due solely to the increased population from which they were derived, irrespective of any adverse influence fog may have had. The deaths for both children and adults were then written out in rows of 26 weeks—the period October to March—for the series of 27 years and summed. The totals revealed certain interesting features. The trend of the deaths among children is altogether different from that among adults. The graph of the former starts from a minimum in October and reaches its maximum in the last week of November, and then falls to what is practically a fixed level for the remaining weeks. On the other hand, the curve for adults, like that for the children, starts at a minimum but goes on increasing, with the exception of a very slight depression in the fourth week of December, and attains its maximum in the first or second week of January.

The Potency of Fog as a Factor in Increasing Respiratory Death-rate.

Having at my disposal the weekly amount of fog, the temperature, the rainfall, and the number of respiratory deaths both among children and adults, I was in a position to test the validity of the claim that fog is a potent factor in producing the increase in the respiratory death-rate. If fog has the alleged destructive effect, then, if no other disturbing factors existed, years containing many foggy days should show a large increase in the number of deaths as compared with those years when fog was less frequent. To test this point, the respiratory deaths among adults in each week from October to March and likewise the amount of fog were totalled for each of the 27 years. The correlation coefficient was then calculated for the amount of fog and the deaths at age 55 years and upwards for the series of 27 years and was found to be +0·441. This coefficient would appear to indicate that, as regards adults, there is an association between the amount of fog in any one year and the respiratory deaths, but, as will be shown later by diagrams, the coefficient is really evidence, not of a relationship between the amount of fog in any one year and the corresponding excess of deaths, but of the combined effect of fog and a low temperature on the respiratory death-rate.

The next point of interest to discuss was at what period of the winter fog produced its greatest effect on the respiratory deaths. For this purpose a table (Table II.) was made of the total deaths among children and adults and the amount of fog in each week of the year for the whole series of the 27 years. From this table it might be inferred that the maximum deaths among children was caused by the November fogs, and the increase among adults by the heavy fogs in December. To verify this, the correlation coefficients were calculated between (1) the amount of fog in the second week of November, the week of maximum fog in this month, and the number of deaths among children in the fourth week of November, the week of maximum deaths age 0–5, for the series of 27 years, and found to be −0·116, and (2) the amount of fog in the third week of December and the number of deaths among adults three weeks later, and found to be −0·066. The size and sign of these coefficients show that the period of maximum fog had no connexion with the causation of the maximum deaths.

TABLE II.—*Showing the Total Number of Deaths from Respiratory Disease among Children and Adults, with the Amount of Fog, in each Week from October to March for 27 Years, Beginning at 1870.*

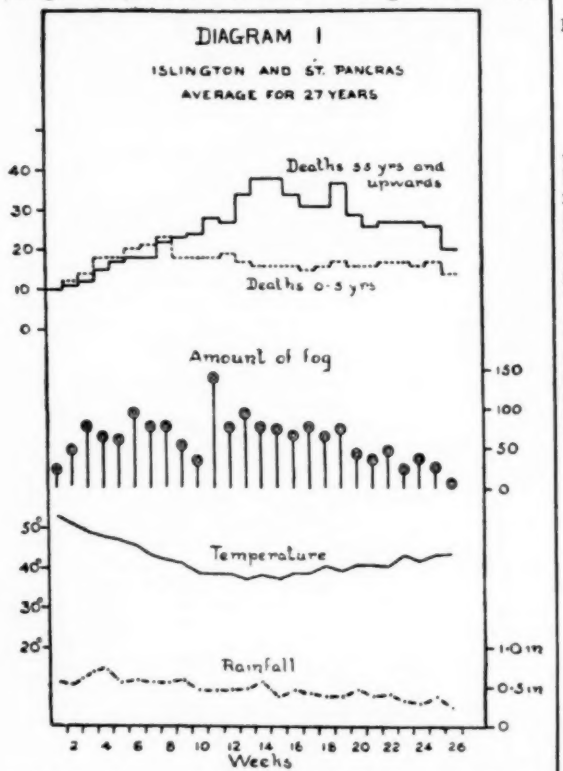
Weeks.	Total deaths among—		Total amount of fog.	Weeks.	Total deaths among—		Total amount of fog.
	Children.	Adults.			Children.	Adults.	
1	264	270	630	14	433	1026	2130
2	331	301	1290	15	440	1033	1985
3	391	319	2050	16	427	920	1775
4	482	414	1700	17	407	845	2110
5	484	463	1610	18	424	849	1735
6	538	489	2580	19	456	1002	2005
7	572	481	2050	20	444	779	1143
8	613	604	2045	21	450	693	1005
9	492	619	1395	22	467	725	1285
10	493	647	925	23	471	727	610
11	480	749	3775	24	433	724	1030
12	508	720	2120	25	457	695	705
13	463	911	2535	26	372	527	180

It now remained to discover the general relationship between the amount of fog and the respiratory deaths in any one week. Accordingly, the amount of fog in each week of the year for the whole series of the 27 years was correlated with the respiratory deaths in the same week and in the subsequent week for both children and adults. In some cases fairly high correlation coefficients were obtained, but they were largely due to one or two observations in the series

and when these were omitted the coefficients became very small.

Effect of Low Temperature combined with Fog.

Having so far failed to trace any decided association between the prevalence of fog and an increased mortality from respiratory disease, it remained to investigate if fog required the conjunction of some other meteorological factor to produce an increase in the number of the weekly deaths. A graph (Diagram I.) was made of the average of the data



in Table II., to which was added the average weekly amount of rain and the average weekly temperature prevailing throughout the 27 years. A reading of the diagram seemed to suggest that the conjoined effect of a low temperature and the prevalence of fog determined the increase in the deaths, particularly among adults. To test this point further, graphs were drawn for the individual years, and this characteristic was clearly confirmed. It was seen that in the same week with the advent of fog there was a large increase in the number of deaths, while at other times there was no material excess of mortality. An explanation of the phenomenon was afforded by the readings of the temperature curves. Whenever the prevalence of fog was associated with a depression in the temperature, then there was a rapid increase in the number of adult deaths, while in the absence of this decline no perceptible movement in the mortality curve took place. To illustrate this fact, Diagrams II., III., and IV. of the weekly deaths among children and adults, with the temperature, rainfall, and the amount of fog, are submitted for certain years. Diagram II. shows that there were three peaks in the mortality curves for the period October, 1874, to March, 1875, particularly defined in the case of the adults and, to a much less degree, in the case of the children, and that at each occurrence they were preceded by a low temperature and fog. On the other hand, in Diagram III., it will be clearly observed that the temperature between October, 1883, and March, 1884, was seldom below 40°, and that there was little oscillation in the number of deaths. The weather records for this winter contain the following details:—

1. Week Ending Nov. 3rd.

Explanatory Notes.

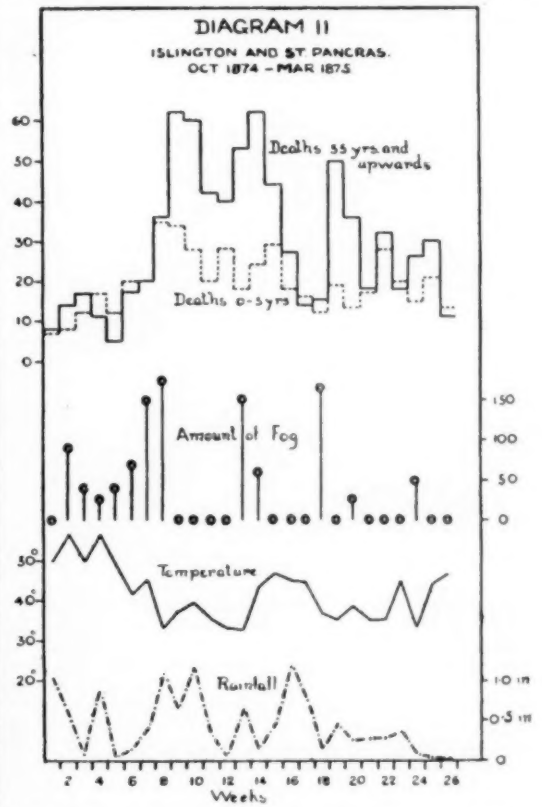
			9 A.M.	9 P.M.
Oct.	28th	Dense fog, 11 A.M.; fog in evening	ff.	Ov.
,,	29th	Foggy morning	Fog.	Fine.
,,	30th	Fair day, colder	,,	,,
,,	31st	Dull and cold	,,	Ov.
Nov.	2nd	Foggy, dark morning	,,	,,

2. Week Ending Dec. 29th.

Dec.	24th	Fog in the morning	Fog.	Ov.
,,	25th	Foggy, dull, damp, and mild	,,	,,
,,	26th	Foggy, dull, but cooler	,,	,,
,,	27th	Fog all day	,,	Misty.
,,	29th	Overcast	,,	Ov.

ff. = very foggy. Ov. = overcast.

From these details it must be inferred that fog was fairly prevalent during the weeks in question, but, as will be seen from the diagram, it had a minimal effect on the deaths, any adverse influence it was likely to have being apparently counteracted by the high temperature prevailing. Diagram IV. is particularly interesting. Although the respiratory mortality after 1890 is largely associated with the prevalence of influenza, there was no epidemic of influenza from October, 1892, to March, 1893, as the weekly deaths in London as a whole were very low. Consequently, the respiratory deaths in this year may be safely regarded as non-influenzal. It will be observed from the diagram that there were two weeks characterised by a high prevalence of fog, one, the week ending Nov. 12th, and the other, the week



ending Dec. 31st. The deaths among the children and adults were uninfluenced by the November fog, during which the temperature was over 44°, but after that in December, when the temperature fell to 27°, there was a rapid increase in the number of deaths among adults, with no corresponding excess among the children. As will be seen from the weather

records for the period, there was a greater amount of fog prevalent in the week ending Nov. 12th.

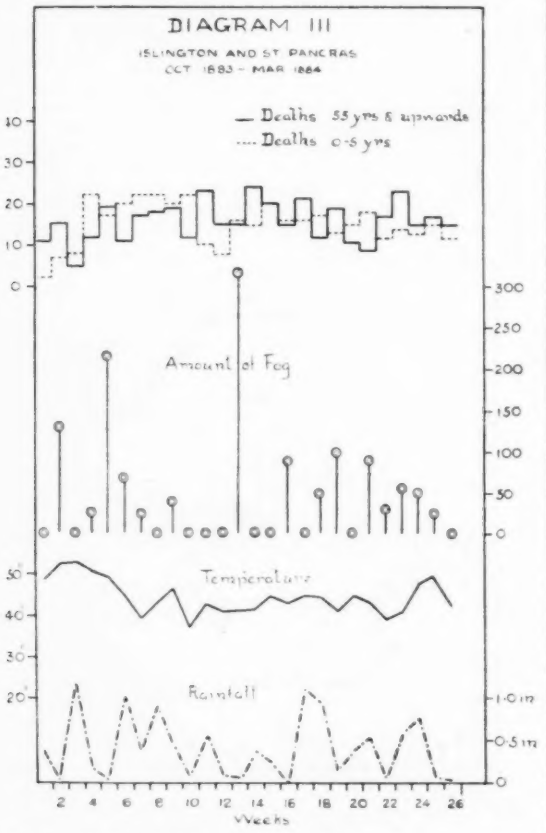
Week Ending Nov. 12th.

			9 A.M.	9 P.M.
Nov.	7th	Misty early, foggy towards evening and sunset	Fog.	Fog.
,,	8th	Fog more or less all day	,,	Ov.
,,	9th	Slight fog till 10 A.M.	Ov.	,,
,,	10th	Fog more or less all day, dense at times in the morning	Fog.	Fog.
,,	11th	Overcast throughout	,,	Ov.
,,	12th	Clear at times, but very dark with high fog	Sl. fog.	,,

Week Ending Dec. 31st.

Dec.	27th	Rather dense fog in morning, clear after 1.30 P.M.	Fog.	Fine.
,,	28th	Fog all day; dense in morning and evening	,,	Fog.
,,	29th	Fog generally dense till 11.30, cleared suddenly, came on dense again at 1 P.M.	,,	Fair.
,,	30th	Fair, but slight fog in morning	Sl. fog.	,,

To see if similar characteristics were present, the figures for London as a whole were graphed for the same year, the weather data used being the records



taken at Greenwich. The deaths in the case of the adults were from age 60 and upwards, as the weekly returns issued by the Registrar-General did not give the number at age 55. The two diagrams were identical—no excess of deaths after the fog in November when a high temperature prevailed, and a large excess among the adults in December following the low temperature and prevalence of fog. The Greenwich weather records are an interesting study for these weeks and are given in detail.

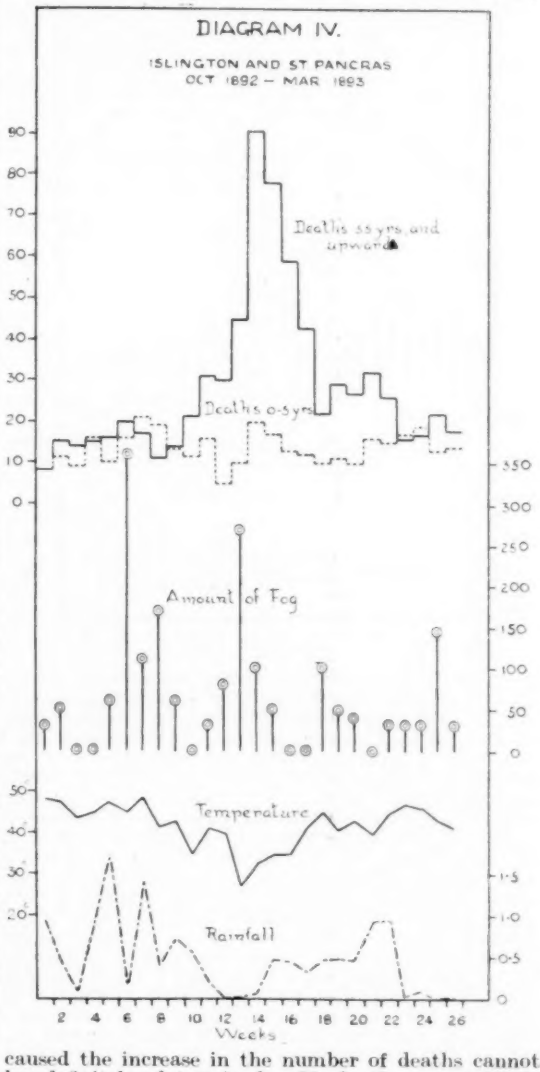
Week Ending Nov. 12th.

Nov.	7th	Hoar-frost in the morning, generally cloudless, very foggy throughout the day.
,,	8th	Dense fog throughout the morning.
,,	9th	Overcast till evening, variable clouds, slightly foggy.
,,	10th	Foggy in morning, overcast and foggy at night.
,,	11th	Overcast, variable fog, occasional fine rain.
,,	12th	Fog and rain in morning, fine for a short time in the afternoon.

Week Ending Dec. 31st.

Dec.	27th	Variable clouds, fog and hoar frost, very cold day.
,,	28th	Overcast, dense fog prevailed throughout, very cold.
,,	29th	Fine, with variable amounts of cloud, slight fog in the morning and night; cold.
,,	30th	Dense fog prevailed throughout the morning. Hoar-frost, very cold.

It is noteworthy that in the weather records for the week ending Dec. 31st there is frequent mention of the presence of hoar-frost. In February, 1880, when there was a great outburst of respiratory deaths both among adults and children in London as a whole, but confined to adults in the St. Pancras and Islington area, the prevalence of hoar-frost, low temperature, and fog are again mentioned in the Greenwich records. Whether the fog, in association with the hoar-frost,



caused the increase in the number of deaths cannot be definitely determined. Much the more likely assumption is that the deciding influence was the conjoint effect of fog and low temperature and that the prevalence of hoar-frost was a mere indication of the decline in temperature.

Conclusions.

From the analysis of the present data there seems sufficient evidence to warrant the following conclusions:—

1. That fog itself has no appreciable effect on the respiratory death-rate, as will be observed from

Diagram III. and the first section of Diagram IV., where it is shown that although fog was rather prevalent there was no increase in the number of the deaths.

2. That if the prevalence of fog is associated with a low temperature and frost, the respiratory death-rate of adults can be influenced very considerably, although the effect is not evident in the case of children. This is illustrated by Diagram II. and the end of Diagram IV., and confirms the conclusions of the late Dr. Russell, of Glasgow, who maintained that "during winter every city was in danger of a catastrophe if certain weather conditions occurred, a combination of frost, fog, and still air for days together." It is also supported by the evidence of Table I., which Councillor Smith constructed for Glasgow.

NICKEL COOKING VESSELS.

ALTHOUGH pure nickel cooking vessels have not yet come into extended use, they have many obvious advantages. Pure nickel is very resistant to corrosion and takes a high polish which is readily retained. It is quite unattacked by soda, and even dilute hydrochloric and sulphuric acids have no appreciable action during a short time. These properties make it an easy matter to keep nickel cooking vessels scrupulously clean; grease may be removed with soda, and calcareous deposits from hard water may be removed by dilute hydrochloric acid. The crucial question, however, is whether foods cooked in nickel vessels can be contaminated with nickel in sufficient quantities to be in the least injurious when consumed regularly over prolonged periods. Nickel is usually regarded as one of the less toxic heavy metals such as iron and aluminium, rather than one of the more toxic group such as copper, lead, and mercury, and extensive investigations which have been made in foreign countries, notably Austria and Russia, have shown that this view is justified, and that no danger is likely to arise from the use of nickel cooking vessels.

Rohde[1] cooked fruits in nickel vessels, and could discover no ill-effects when these were eaten. These results were confirmed and amplified by Ludwig,[2] who cooked the food of a large household in nickel vessels for two and a half years and determined the amount of nickel in the different foods. The household consisted of nine or ten persons of ages 6–56, and none of them experienced the slightest ill-effects. The vessels used by Ludwig contained 98 per cent. of nickel, with traces of copper, iron, manganese, aluminium, and cobalt. A more elaborate investigation comprising pharmacological, chemical, and culinary experiments was published by Dzerzgowsky and Schumoff-Sieber in 1906.[3] Dogs were given daily doses of nickel sulphate equivalent to 5 to 10 mg. of metallic nickel per day for 200–220 days without any ill-effects being observed. At the end of the period, in which a total of 10–25 g. of metallic nickel had been given, no nickel was found in the organism, showing that no absorption takes place from the stomach and intestines. Repeated daily doses of as much as 0·5 g. of nickel sulphate were found to be harmless to a dog of 9 kg., corresponding to 0·70 g. of metallic nickel per day for a man of 70 kg. The foods cooked by them contained from 0·2 mg. nickel to 23 mg. per kg. in the case of very acid foods (Table I.), and this would introduce very much less than the above-mentioned tolerable amount. The amount of nickel dissolved by foods was found to be roughly proportional to the acidity and to the time of cooking. Elaborate tables are given showing the effects on nickel vessels of solutions of acetic, oxalic, butyric, lactic, and tartaric acids, both alone and in conjunction with common salt. Salt increases the amount of nickel dissolved by the organic acids. For example, 4 litres of 0·3 per cent. acetic acid boiled for three hours dissolved 0·0047 per cent. of nickel, and the same with the addition of 5 per cent. salt dissolved 0·0137 per cent. of nickel. If these were allowed to stand in the nickel saucepans for 11 hours after the three hours' boiling, the amounts of dissolved nickel were increased to 0·0203 per cent. and 0·0361 per cent. respectively. The area of nickel exposed to the acids in these experiments was 1209 square cm.

TABLE I.—*Milligrammes Nickel per kilogramme Food.*

—	I.	II.	III.	IV.
Water and tea	—	—	0·2	—
Water, salt water, meat extract and milk	—	3·5–5·3	—	—
Milk	v. s. tr.	—	—	—
Coffee	—	—	—	0·03
Gruel	—	—	3·1	—
Boiled beef	9·0	—	—	—
,, venison	19·0	—	—	—
,, peas	12–16	—	—	—
Beef and bouillon	—	26–64	—	—
Potato soup	—	—	10·9	—
,, pulp	—	26–40	—	—
Beetroot	11·6	—	10·6	—
Spinach	26	22·4	—	—
Sorrel	129	—	23	—
Boiled lentils	24	—	—	—
,, ,, with vinegar	35	—	—	—
Sauerkraut	54–129	18–57	—	127
Boiled plums	35	—	—	—
,, damsons and plums	—	13·3	—	—
Fruit boiled with 2 per cent. acetic acid	—	65–67	—	—
Apple compôte	—	—	—	46·0
Potatoes fried in butter	—	—	—	79·8
Veal cutlet	tr.	—	—	—
Lamb	tr.	—	—	—
Fried chicken	tr.	—	—	—
Sauerkraut cooked with lard	—	—	—	121·3
Savoy cabbage	—	—	—	83

I., Ludwig; II., Lehmann; III., Dzerzgowsky and Schumoff-Sieber; IV., Normann and Hugel. v. s. tr. = very small trace.

Similar exhaustive experiments were subsequently published by Lehmann,[4] who also concluded that nickel cooking vessels were absolutely safe and hygienic. The same conclusion that nickel vessels were safe and suitable for cooking was reached by Normann and Hugel in 1913,[5] although these investigators found a rather higher proportion of nickel in most of the foods cooked by them. The quantities of nickel found by foreign investigators are summarised in Table I.

A search of the literature has failed to reveal any real evidence on the other side. The only case recorded where poisoning is attributed to metallic nickel in food or drink is one described by Faichnie and Langrish,[6] in which barley-water and lime-juice mixed stored in a large metal urn for a day produced sickness and vomiting. The urn was not of nickel, but of white metal coated with nickel, and although it is stated that analysis of the drink showed the presence of nickel, no quantity is mentioned, and no details are given. The poisoning may have been due to other metals such as copper. This occurrence took place in India during the hot season.

The degree of purity of the nickel vessels used by the previously quoted Continental investigators is not stated except by Ludwig, and the nickel cooking vessels made in this country are considerably purer than his. A specimen supplied to us, manufactured by Messrs. Joseph Sankey and Son, of Bilston, had the composition:—Nickel, 99·31 per cent.; iron, 0·44 per cent.; magnesium, 0·11 per cent.; carbon, 0·06 per cent.; copper, 0·05 per cent.; silicon, 0·03 per cent.; and experiments were made to see how the purer nickel behaved in comparison with that used by other investigators. In general, the results obtained with water, acetic acid, salt, &c., are similar to those of Dzerzgowsky and Schumoff-Sieber, but the

[1] Archiv für Hygiene, ix., 331–349.
[2] Oestr. Chem. Ztg., 1898, i., 3.
[3] Biochem. Ztschr., ii., 190–218.
[4] Archiv für Hygiene, 1909, lxviii., 421.
[5] Chemiker Ztg., xxxvii., 815; Seifen Ztg., 1913, 959.
[6] Jour. R.A.M.C., 1910, xv., 484.

foods cooked showed less nickel dissolved in them than in the case of the continental experiments. Results are summarised in Table II., and it will

TABLE II.—*British Pure Nickel Cooking Vessels.*

Material boiled or cooked in the nickel vessel.	Time of boiling in hours.	Mg. nickel per kg. of material.	Mg. nickel dissolved per sq. decimetre of surface.
Decinormal sodium carbonate	1	0	0
London tap water	2	0	0
Distilled water	1	0·2	0·03
0·8 per cent. NaCl	1	0·9	0·23
0·1 per cent. acetic acid with 2 per cent. NaCl	1½	21·0	5·94
0·3 per cent. acetic acid with 0·8 per cent. NaCl ..	1	22·4	4·68
1 per cent. citric acid ..	1	45·0	9·4
4 per cent. acetic acid ..	1	260·0	54·1
Rhubarb	½	4·0	0·60
Stewed lamb	1½ *	v. sl. tr.	—
Boiled broad beans	½	0	0
Potatoes fried in lard ..	—	0	0
Lard fried alone	—	0	0

* Left in nickel saucepan overnight. v. sl. tr.—Very slight trace.

be seen that the quantities of nickel found are quite without significance, even in the case of such an acid food as rhubarb. Onions were cooked to see whether the large proportion of sulphur contained in them caused any blackening through the formation of nickel sulphide. The onions themselves were not stained at all, but the saucepan showed a slight brown discoloration of nickel sulphide, which was easily removed.

These pure nickel vessels are therefore eminently suitable from the point of view of metallic contamination of the food, and quite equal to those made of aluminium in this respect. They are superior to aluminium with regard to cleanliness. They remain quite bright if left filled with water for several days, whereas aluminium is liable to become partially coated with spongy oxide. Calcareous deposits may be removed by dilute hydrochloric acid, without any nickel being dissolved. This was proved by etching some of the nickel with nitric acid and then soaking it for a quarter of an hour in 2 × normal hydrochloric acid, when no trace of nickel could be found in solution. Pure nickel therefore appears to be the ideal material for cooking vessels from the hygienic point of view, its only drawback being its high first cost, though this may be offset by its extreme durability, in which respect it is probably far superior to any other material used for this purpose.

Similar nickel utensils to the sample experimented with are manufactured by Messrs. Joseph Sankey and Sons from sheets made of pure Mond nickel, guaranteed over 99 per cent., and are produced by Henry Wiggin and Co., Ltd., 55 George-street Parade, Birmingham.

INTERNATIONAL DENTAL FEDERATION.

A MEETING of the International Dental Federation was held in the city of Luxemburg on August 3rd, 4th, and 5th, and was attended by delegates from numerous dental associations in various parts of the world. The proceedings opened in the town hall under the presidency of the Minister of Education, Director-General Herr Nevens, who welcomed the delegates to Luxemburg and wished them a most successful conference. Among the delegates who spoke were: Mr. Blatter (Paris), Herr Schäeffer-Stuckert (Frankfort-on-Main), Dr. G. Bandoux (Brussels), Dr. G. Griepeschock (Riga), Dr. Friesell (Pittsburgh, U.S.A.), and Mr. W. B. Paterson (London).

Mr. Paterson remarked upon the reappearance of a spirit of fraternity exhibited in the speeches of the delegates. He believed that it was the first time since the war that such an amicable disposition had been shown in any meeting, whether dental or medical.

Dr. Truman W. Brophy (Chicago), President of the Federation, thanked the Minister and the other speakers, and desired that a message expressive of the grateful thanks of the meeting might be conveyed to the Grand Duchess of Luxemburg for her patronage. The programme of the meeting was afterwards discussed in detail in the various commissions appointed.

The Hygiene Commission reported the general and increasing prevalence of dental caries throughout the civilised countries of the world. All the delegates present were unanimous upon that point.

Upon that report the Federation advised the desirability of establishing a dental department under a dental controller in the Ministries of Health of all countries. Only two or three countries had adopted this course so far.

The Commission on Documentation reported that it had established at the Palais Mondial, Brussels, a catalogue of all the important works and papers on dental subjects, extending back for a period of over 17 years. Copies or references could be obtained for a nominal sum by letter addressed to the director.

The relief fund for Russian dentists had been distributed in 1923 by Dr. Florestan Aguilar (Madrid) on behalf of the International Dental Federation. Leningrad (Petrograd), Moscow, and Odessa had been visited for that purpose, and 260 complete outfits of dental instruments had been distributed. Dr. Griepeschock (Riga), who had been imprisoned by the Bolsheviks, described the gratitude shown by Russian dentists for these valuable gifts.

Questions relating to the organisation of the next or seventh International Dental Congress, at which a membership of over 8000 members was expected, were brought forward by Dr. King (Chicago), the general secretary of the Congress, and were replied to by Dr. W. Guy (Edinburgh), Prof. W. H. Gilmour (Liverpool), and Dr. Georges Villain (Paris).

The award of the Miller Memorial Prize for important work in connexion with dentistry was made to Dr. Brophy, dean of the Chicago Dental School. Mr. J. Howard Mummery (London) announced the result of the ballot for the prize, and congratulated the recipient.

The next meeting of the International Dental Federation was fixed to take place in Geneva on August 5th and two following days in 1925 at the invitation of the Swiss National Dental Association.

GENERAL MEDICAL COUNCIL

MEETING OF EXECUTIVE COMMITTEE, JULY 28TH.

THE Committee was officially notified of the reappointment of Dr. David Hepburn as representative of the University of Wales for one year from July 16th, 1924, and of Dr. Arthur Thomson as representative of the University of Oxford for five years from June 21st, 1924.

Notice was taken of the restoration to the Medical Register—the prescribed conditions having been duly fulfilled—of the following names erased in conformity with Section XIV. of the Medical Act, 1858:—

Dawson, Thomas (S.)	Raitt, Oswald (S.)
Harmar, Mary (S.)	Russell, Wilfred A.
Hill, Arthur R. (S.)	Thompson, Thomas R. S. (I.)
Hillier, Sidney (S.)	Tough, James B. K. (S.)
Orr, Andrew W. (I.)	Woo, Arthur W.

the names with the bracketed affixes (S.) and (I.) having been sent for restoration by the Scottish and Irish Branch Registrars respectively.

Sir Nestor Tirard was appointed to attend a conference at the Ministry of Health of representatives of Departments and bodies concerned, in anticipation of the International Conference for the Unification of Drastic Drugs to be held in 1925 at Brussels.

In regard to the refusal of the Council of Physicians and Surgeons of New Brunswick to register in that province an applicant whose name appeared upon the

Colonial List of the Medical Register, the Council had been informed that reciprocity would lapse on any refusal to register a class of practitioners whose names appeared on the Medical Register of the United Kingdom.

Colonel R. A. Needham, officially appointed to inspect Indian Universities and Colleges of Medicine, having been refused admission to the final examinations of Calcutta University, the University authorities had been informed that, in the absence of a report on these examinations, recognition by the G.M.C. of the medical degrees of that University would cease on Nov. 30th next.

In regard to the proposed Articles of Association of the Society of Radiographers, the Committee resolved to inform the Board of Trade of their strong objection to the last paragraph in Article 27 which proposed to entrust to an unqualified person the duty on his own responsibility of making and reporting a diagnosis of disease or injury to patients or others.

The Services.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. A. A. Seeds retires on ret. pay.

Capts. to be Majs.: R. B. Price (Prov.), J. B. A. Wigmore (Prov.), J. Hare (Prov.), R. A. Flood (Prov.), E. C. Lang (Prov.), L. T. Poole (Prov.), C. C. Jones (Prov.), E. V. Whitby, E. U. Russell (Prov.), R. G. Shaw, N. T. Whitehead (and remains secd.), J. C. Sproule (Prov.), A. F. C. Martyn, G. F. Allison (Prov.), R. C. Carlyle (Prov.) (and remains secd.), A. A. M. Davies, Bt. Maj. L. Dunbar, and Bt. Maj. H. F. Panton (Prov.).

Capt. J. E. Brooks is restd. to the estabt.

Capt. J. W. Cannon retires receiving a gratuity.

Lt. M. A. Graham-Yooll is restd. to the estabt.

TERRITORIAL ARMY.

G. H. R. Gibson (late Canadian Army Med. Corps) to be Captain; W. M. Farr, J. J. Mitchell, I. Morgan, and F. A. Smorfitt to be Lts.; Hon. Lt. O. F. W. Robinson to be Lt.

DEATHS IN THE SERVICES.

We regret to announce the death of Colonel Reginald James Cope Cottell, C.B.E., R.A.M.C., on August 7th, after a prolonged illness borne with cheerful fortitude. The fourth son of Major James William Cottell, H.E.I.C.S., he was born at Rodborough, Gloucestershire, in October, 1858. He studied medicine at St. George's Hospital and obtained the Membership of the Royal College of Surgeons of England in 1886, having in the previous year become a Licentiate of the Society of Apothecaries. Immediately after qualifying he obtained a commission in the Royal Army Medical Corps and was subsequently stationed in Natal. He served throughout the South African War, 1899–1902, and received for his services the Queen's Medal and the King's Medal, both with three clasps. After serving in the Mediterranean he was appointed in 1906 assistant surgeon to the Royal Hospital, Chelsea, and some four years later physician and surgeon, positions which he held for three years. On the outbreak of the war he was put in charge of the recruiting stations in London and from 1915 to 1919 was commandant of King George's Hospital. In 1918 he was made a Knight of Grace of the Order of St. John of Jerusalem and in 1919 was awarded the C.B.E. (Military). He also received the rank of Brevet-Colonel. Colonel Cottell, who leaves a widow and three daughters, possessed a high sense of duty and was a very popular and competent officer.

GOVERNMENT publications on health matters are not yet as readily accessible at H.M. Stationery Office as they might be. Application for the Interim Report on Preservatives in Food, noticed in another column, was met by the statement that it was "not yet out." Application for Circular 1337 of the Board of Education dealing with the closure of schools during epidemics, and giving the consensus of medical opinion on this practice, was met by the rejoinder "not on sale." Application for the white paper on the Cost of Health Services, issued a week or two ago, elicited the statement that the document was "out of print." Whether too early, or too late, or ineligible, the inquirer may be prevented from satisfying laudable curiosity about matters of great moment to the health of the community. The attempt to purchase the publications was made on Tuesday morning, August 12th.

Medicine and the Law.

The Payment of Witness Fees to Medical Officers.

AT the last meeting before the summer recess the London County Council reached an important decision regarding the fees payable to medical officers of asylums, hospitals, and institutions for performing post-mortem examinations and giving evidence at coroners' inquests. Shortly expressed, the decision of the Council is to abolish payment altogether.

Section 22 of the Coroners Act, 1887, provides for payment of a fee of 2 guineas to private practitioners in this connexion. Under Subsection 2, however, no fee is payable when the deceased has died in a "county or other lunatic asylum, or in a public hospital, infirmary, or other medical institution," whether supported by endowments or by voluntary subscriptions. Notwithstanding this provision, fees have not been withheld from medical officers of workhouses and Poor-law institutions, but the attention of the L.C.C. has been directed to the question by a district auditor, who recently took exception to certain witness fees paid to medical officers of hospitals controlled by the Metropolitan Asylums Board. One such medical officer, on being asked to refund the fee, refused to do so, and the Public Control Committee took the view that it was "inequitable that a medical officer who happened to be employed in a certain type of publicly maintained institution should be receiving a fee, whereas another medical officer performing analogous duties and practically in a similar position should not be so paid." The Minister of Health was consulted by the Council, but declined to express any opinion on the matter. The district auditor on June 16th drew the Council's attention to the fact that, on the advice of eminent counsel, Poor-law union infirmaries had not hitherto been regarded as coming within the prohibition of the Act. He pointed out, however, that in recent years the character of these infirmaries had undergone a considerable change, and that in many instances they were in no way inferior to the best general hospitals. He had, therefore, decided that inquest fees were not payable to medical officers of "hospitals controlled by the Metropolitan Asylums Board, Poor-law infirmaries, general infirmaries, prisons, or other medical institutions of a public character." In his opinion such payments, if made, were illegal and an improper charge on the Council's funds. The London County Council has accepted this ruling and fixed Sept. 1st next as the date of discontinuance of the payments. The resolution passed by the Council was in the following terms:—

"That, as from 1st September, 1924, the payment to medical officers of hospitals controlled by the Metropolitan Asylums Board, workhouses, Poor-law infirmaries, prisons, and other medical institutions of a public character, of fees under Section 22 of the Coroners Act, 1887, for making post-mortem examinations and giving evidence at inquests held in the County of London be discontinued."

The Home Secretary's Decision in Cases of Murder.

The Right Hon. Edward Shortt, who has had experience of the responsibility of the Home Secretary in granting or withholding reprieves, where murderers have been sentenced to death, contributed recently to the *Daily Express* an article recommending that the procedure should be altered and that the final decision on such occasions should rest with a committee. Probably the duty, which in the present circumstances the Home Secretary performs alone, is one of which most men would gladly be relieved, and the suggestion that a committee should undertake it is not a new one, and is quite likely some day to be considered by Parliament. Mr. Shortt, however, has made a definite proposal that the committee should be composed of the

Home Secretary, the Lord Chief Justice, and the judge who tried the convicted person. This seems a combination open to objections, particularly with regard to the judge who tried the case. Moreover, if such a committee is ever instituted it should include a member of the medical profession of recognised eminence. He would not necessarily, or desirably, be an alienist or one connected with any special branch of medicine. Prisoners are reprieved upon medical grounds of varying nature. For example, True was reprieved on the ground of his mental condition; Mrs. Maybrick and others have been sentenced and not executed on account of questions relating to the precise cause of the death of the person alleged to have been murdered. If such a committee as that suggested should ever be formed, there would certainly be many occasions upon which a medical man would materially assist his colleagues in the weighing of medical evidence.

Coroners and Murder or Manslaughter.

Sir Harry Poland, in a letter to the *Times*, has made a suggestion that when an inquest is being held by a coroner and a prosecution takes place at the same time in a criminal court for murder or manslaughter, the same death forming the subject of the prosecution and of the inquest, the inquest should be suspended until the criminal proceedings have been concluded. A proposal coming from so eminent an authority on the practical working of the criminal law commands respect, and no doubt full consideration will be given to Sir Harry Poland's suggestion whenever (or if ever) the long-delayed amendment of the law relating to inquests takes place. He cites the report of a Royal Commission in 1879, which said that "the proceeding upon coroner's inquisitions is a relic of the times preceding the appointment of justices of the peace." His strongest argument against the dual proceedings, in the coroner's court and before magistrates, which precede trial at assizes, is that the time of witnesses is taken up unnecessarily. Medical practitioners who have had to give evidence on such occasions will be aware how many valuable hours are wasted in waiting about on these occasions, in addition to the possibly brief period of time which is spent in the witness-box. The time of experts is no less wasted in repeating the same evidence which again has to be given later. All these should be thoroughly in sympathy with the proposed alteration, and it will be interesting to see what legal critics may have to say on the subject. They are aware of the anomalies attaching to inquest verdicts and proceedings. In the recent case of Vaquier the coroner's jury found a verdict which left open the question of who had placed the poison in the bottle from which the dead man took the fatal draught, and this was employed as an argument by some of those persons who advocated the Frenchman's reprieve. That it has had no effect on Vaquier's ultimate fate tends to show that the verdict at an inquest is of little value. At the inquest upon Miss Kaye letters were read from the deceased to her friends which could not have been made evidence at Mahon's trial, which suggests that an inquest may prejudice a prisoner when tried for his life, owing to the publication of matter not relevant to his guilt. In fact, in the case of Mahon a letter of similar character to those read at the inquest led to newspapers which published it being fined for "contempt of court." The gravity of the penalty attaching to murder may be urged as an argument for retaining the triple hearing, but it seems doubtful whether that is a reason of such weight that it ought to prevail. The fact of coroners not being responsible for inquiries in obvious cases of murder would do away with any argument against the appointment of medical men in preference to lawyers, and the medical man of experience would show himself the best person to inquire into all unexplained deaths, including those which through his investigation may turn out to have been due to criminal acts. Sir Harry Poland's suggestion has much to commend it.

A Secret Well Kept.

In a case committed for trial at Rotherham, the prisoner being charged with concealment of birth after the finding of the dismembered body of an infant, observations were made by counsel upon the conduct of a medical man, Dr. W. L. Dibb, and of a deputy coroner, to the effect that they had not assisted the police in elucidating the case. Dr. Dibb, in particular, had given no information to the police as to what he knew or suspected with regard to the remains which had been submitted to him. In explanation of this, at the close of his evidence before the magistrates, Dr. Dibb made a statement to the effect that, finding himself in the possession of certain information, he had consulted a solicitor as to the course he should adopt, and the solicitor had expressed a wish to take counsel's opinion before expressing himself definitely. The witness had also consulted a senior practitioner at Rotherham and a consultant at Sheffield, who had agreed that he ought not to make a statement to the police. In the witness-box Dr. Dibb had given evidence, after having heard authorities cited by counsel, which were to the effect that he could not refuse to do so. He appears to have acted perfectly correctly, both in giving evidence when in the witness-box and when the court refused to absolve him from the obligation to give it, and in not going out of his way to make statements to the police before. He also acted wisely in taking advice on the subject from those best qualified to assist him and in acting on their recommendations. The kind of circumstances, in which he evidently found himself involved, are such as may occur in the practice of any medical man. A doctor is not at law absolved owing to his profession from the ordinary duties of a citizen to assist in the administration of justice if called upon to do so. No medical man, however, will admit that because his profession brings him in contact with what may be a "guilty secret," his duty as a citizen calls upon him to play the detective and assist the police in any and every case in which he suspects the past or future perpetration of a criminal act by his patient. He must be guided to some extent by the facts of the particular case, and it may be suggested as an example that if he has reason to believe that the life of a human being is threatened, or that murder has been committed, he is placed in a very different position from that of merely suspecting that a patient may have been connected with an offence against property.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 2ND, 1924.

Notifications.—The following cases of infectious disease were notified during the week, namely:—Small-pox, 36; scarlet fever, 1330; diphtheria, 663; enteric fever, 94; pneumonia, 458; puerperal fever, 37; cerebro-spinal fever, 2; acute poliomyelitis, 27; acute polio-encephalitis, 4; encephalitis lethargica, 68; dysentery, 6; ophthalmia neonatorum, 108. Of the cases of ophthalmia 12 were reported from the County of London, 3 from West Hartlepool, 2 from Easington R.D. (co. Durham), 5 from Liverpool, 4 from Newcastle-on-Tyne, 4 from Stoke-on-Trent, 12 from Birmingham, 7 from Sheffield; 6 from the boroughs and urban districts of Glamorgan—namely, Aberdare, Caerphilly, Ogmore and Garw, Port Talbot (each 1), and Rhondda (2).

Deaths.—In the aggregate of great towns (including London) there were 6 deaths from enteric fever, 9 from scarlet fever, 21 from diphtheria, 22 from measles, and 15 from influenza. In London itself the diphtheria deaths numbered 8.

THE LATE DR. R. T. JONES.—Dr Richard Thomas Jones, L.R.F.P.S. Glasg. and L.S.A. Lond, who recently died at his residence in Harlech, Merionethshire, began to practise in 1879. He received his medical education at Owens College, Manchester, and at Guy's Hospital, London, and settled in Wales, where he worked for 45 years. He was one of the first medical men in the Principality to advocate total abstinence on which subject he wrote several pamphlets. He was medical officer and public vaccinator for the Llanfihangel district of the Festiniog Union. For over 30 years he was district magistrate and was also High Sheriff of Merioneth.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT BRADFORD.

(*Continued from p. 296.*)

SECTION OF SURGERY.

WEDNESDAY, JULY 23RD.

ON the first day, Sir CUTHBERT WALLACE, the President, being in the chair, a discussion on

Acute Osteomyelitis

was opened by Mr. JOHN FRASER (Edinburgh). He began by pointing out the confusion which exists as to anatomical terms in relation to the structure of the bones, and defined the metaphysis as that portion of the diaphysis which lies adjacent to the epiphyseal cartilage. He said: The metaphysis is the site during the years of growth of the most intense cell activity and is the most vascular area of the bone. It is the site of origin of most of the inflammatory diseases of the bones, and in particular of acute osteomyelitis. This is essentially an infective process in the interior of the bone, the endosteum and the marrow being first affected. It is only at a later stage that the infection spreads through the bone and involves the periosteum. A primary periostitis is extremely rare. Acute osteomyelitis is then the result of an acute pyogenic infection of the metaphysis, and it is essentially an affection of the age of growth. In the vast majority of cases the infection is blood-borne, and this presupposes a mild form of septicæmia. That such a septicæmia occurs, and indeed is common in young children, the recent work of Lipschitz shows. The source may be any septic focus, in the teeth, tonsils, sinuses, or skin for example, or pneumonia and the exanthemata. An important source is the umbilicus, and Mr. Fraser referred to a series of 30 cases in young infants which he had collected in the last four years, all of them fatal. In his opinion umbilical infection is a common origin of obscure blood infection in infancy, the infection sometimes persisting until the years of later childhood. The disease tends to be localised in certain special sites, and in order of frequency these are the upper end of the tibia, the lower end of the femur, the lower end of the tibia, and the upper end of the humerus. Slight trauma is probably an important factor in causation, and this would explain the high proportion of cases in boys and in the lower limbs, but the trauma must be slight, probably resulting only in a small metaphyseal hæmorrhage. The large metaphyseal surfaces seem to be more readily affected than the small. Boys are affected more often than girls in the proportion of 6 to 1, and the eighth to the twelfth year is the period in which the disease is most common. In a series of 400 cases the responsible organism was the *Staphylococcus aureus* in 78 per cent., the pneumococcus in 14 per cent., and the streptococcus in 6 per cent. The number of cases of pneumococcal infection was an important point to be discussed later.

The disease starts in the metaphysis with an intense primary infection of the medulla. The inflammatory products are under extreme tension, and this accounts for the intensity of the local symptoms and the severity of the toxæmia which results. From the point of view of prognosis this is the most dangerous stage, for it is now that septicæmia in an acute form is most likely to occur. The second stage is evidenced by a spread of the infection from the interior of the bone into the subperiosteal area. The vessels and spaces of the Haversian canals are the routes along which the migration occurs, and a serous subperiosteal effusion is followed by a purulent one. With the relief of tension the symptoms abate and the prognosis improves. The facility with which the second stage can be established will depend on the number of the Haversian canals and the porosity of the bone, and the density of the femur may account for the severity of the symptoms associated with infections of this bone. The greater porosity of the tibia and the humerus makes it easier for the products of inflammation to escape from the interior of the bone. The third stage is that of reaction. The osteoblasts in the deeper layers of the periosteum proliferate, an involucrum is laid down, and the dead portion of the diaphysis is separated by the active phagocytic action of the granulation tissue which is formed.

The *clinical features* are intense and distinctive. There is the agonising pain of the early stage while the infection is still locked up under tension in the interior of the bone. It is during this stage that the signs of toxæmia—the high temperature, the delirium, the poisoned appearance—are greatest. It is at this stage that a massive invasion of the blood-stream may inaugurate a septicæmia which by its intensity overshadows the local signs. With the relief of tension which characterises the stage of subperiosteal effusion there is an immediate abatement of signs and symptoms, the pain diminishes, the temperature falls, the general appearance improves. But there is an element of danger in this stage because the sudden relief of symptoms may raise doubts as to the veracity of the diagnosis. Unless the condition is relieved by treatment the signs and symptoms are re-established as the tension again rises, and the features are now those of a local septic infection.

The *diagnosis* is usually established without much difficulty from the intensity of the local symptoms and the evidences of severe toxic absorption. In some cases the depth of the lesion may lead to difficulty. Thus osteomyelitis of the ilium may be mistaken for appendicitis or infection of the hip-joint. A blood count should avoid confusion with acute rheumatism, and cellulitis should be excluded by the less intense toxæmia by which it is usually accompanied. As regards prognosis, the more distal the lesion and the more porous the bone the better is the outlook. The real danger lies in the septicæmia which may develop in the first stage of the disease. The tendency to this is perhaps greater in young children.

The speaker was of opinion that in a certain class of case operation was neither necessary nor desirable. These were the cases described by pathologists as albuminous or serous osteomyelitis, a large proportion of which were produced by pneumococcal infection. In these cases operation in the early stages was likely to result in spreading the infection and in the production of necrosis. They usually occur in babies and young children, the temperature is rarely as high as in the ordinary suppurative osteomyelitis, the toxæmia is slight, and the neighbouring joint is usually the site of a serous effusion. A blood count shows that there is only a small degree of leucocytosis. In these cases operation should be delayed, and extension applied to the limb, with fixation splints and hot local applications. Under this treatment a large number of the cases will resolve, and even if suppuration ensues it is local in its extent. It is to be suspected if the temperature rises after a preliminary fall, if pain persists, or if local redness or œdema appear. Relief may be obtained by a single trephine opening over the focus of suppuration. In the ordinary cases, however, immediate operation is essential in order to cut short the grave risks of the first stage. A trephine opening is first made over the affected metaphysis, and this is followed by a series of openings along the shaft at intervals of three-quarters of an inch until healthy marrow is reached. The intervening bone is now cut away with a chisel, so as to fully expose the infected area, but the marrow is not touched at all, as scraping it only disseminates the infection and leads to necrosis of the bone. The wound is left widely open and Carrel-Dakin treatment is established. In three weeks it may be possible to close the wound partially by secondary suture. The speaker had tried the method of subperiosteal resection of the affected portion of the diaphysis, but has abandoned it except in those cases where the whole of the diaphysis has perished. He considered that it was likely to dissemi-

nate the infection, and that there was a real risk that a new bone would fail to develop. He regarded the method as justifiable only in late and neglected cases, such as should not now occur.

The *general treatment* of these cases has not received the attention it deserves. Regarding osteomyelitis as primarily a septicæmia with a secondary local focus, it is obvious that the general infection should receive adequate treatment. He advised the use of vaccines, commencing with 200 million of a stock staphylococcal vaccine, and going on to an autogenous vaccine as soon as possible. In grave cases a stock serum, a specially immunised serum, or ordinary horse serum are useful. Blood transfusion had given striking results, especially when combined with exsanguination, both in the very acute cases and in those in which septicæmia persists in spite of treatment.

Discussion.

The discussion which followed turned chiefly on two points—the avoidance of operation in mild cases and subperiosteal resection of the bone. Mr. B. C. MAYBURY (London) held that early operation is wrong in all mild cases and would not admit that expectant treatment should be limited to those where a pneumococcal infection was suspected. He regarded osteomyelitis as a localisation of a pre-existing septicæmia, and pointed to the widespread pain in the limbs which often occurs as a prodromal symptom as evidence of multiple abortive infections. His views were supported by Dr. T. W. LIPSCOMB (Sydney), who stated that in Australia, thanks to cleanliness and fresh air, acute osteomyelitis is rare, and that most cases clear up on expectant treatment. It is remarkable that even in this country cases among the upper classes are rare. It would appear to be essentially a disease of dirt and lack of nourishment.

Very divergent views were expressed as to the value of resection of the affected portions of the diaphysis. Mr. ALEX. MITCHELL (Aberdeen) and Mr. ACTON DAVIS (London) supported the method strongly as leading to a more rapid convalescence and to the formation of a solid core of bone instead of a hollow involucrum which might contain a persistent abscess cavity. Mr. Mitchell regarded it as the method of choice in severe cases where the bone was stripped of periosteum in the greater part of its circumference. He treats the resulting cavity by the Carrel-Dakin method, followed by secondary suture of the wound. He regards early movement as essential, and in the series of photographs which he showed the range of movement obtained was remarkable.

The general impression left by the discussion, in which Sir CUTHBERT WALLACE, Prof. G. E. GASK (London), and several other surgeons took part, was that in mild cases rest, extension, and hot applications might abort the disease, that in most cases a careful and limited exposure of the medulla is sufficient, and that in those cases where the periosteum is completely stripped from the whole circumference of the bone resection of the affected portion of the shaft is the most rapid and effective method. These last cases are, however, the result of neglect and ought never to be seen.

THURSDAY, JULY 24TH.

On the second day, Prof. G. E. GASK, Vice-President, being in the chair, a discussion on

Post-operative Pulmonary Embolism

was opened by Mr. J. P. LOCKHART-MUMMERY (London). He pointed out that the condition is probably much more common than is generally supposed, for probably nine out of ten cases recover, and that it seems likely that a large proportion of cases of post-operative pneumonia are really cases of pulmonary embolism. It may occur at any period after operation up to several weeks, but is most common about the ninth day. The average incidence of fatal cases is about one for every thousand operations. The onset is accompanied by acute dyspnœa and pain in the chest, but if the patient survives ten minutes the symptoms subside and he generally recovers. He will, however, have signs of a localised pneumonia, with rise of temperature, cough, rusty sputum, dullness, and tubular breathing. The distinction from ordinary pneumonia lies in the acute pain and dyspnœa of the onset, the comparatively low temperature, and the previous good health. Sudden death after operation may occur as the result of cerebral embolism, and it was shown by Wilson, of the Mayo Clinic, that 20 per cent. of such deaths were of this nature. It seems probable that the source of the embolus may be a primary pulmonary thrombosis. Where, on the other hand, a large area of the pulmonary arterial field is cut off the symptoms are those of severe cardiac embarrassment, and the dyspnœa is not due to the fact that part of the lung is put out of action but to the strain put on the heart by the sudden limitation of the area of pulmonary circulation. It follows that the administration of strychnine and stimulants during such an attack is entirely wrong and that the proper treatment is the use of amyl nitrite, morphine, and atropine. A loose clot passing through the right side of the heart may completely block one or both pulmonary arteries, or it may pass further on and come to rest in one of the smaller pulmonary arteries. In the former case death will ensue in a few minutes from the strain thrown on the right side of the heart, whilst in the latter the circulation will be cut off from a cone-shaped portion of the lung and symptoms of localised pneumonia will result. In any event the pulmonary embolism is a secondary condition, and the primary and important question is the source of the clot. In the few cases where definite evidence is available the primary clot has generally been formed in the internal or external iliac veins, or at their junction with the inferior vena cava. It has frequently been assumed, the speaker said, that the clot arises in the area of operation, but this is usually improbable and often impossible. The bulk of the fatal cases of pulmonary embolism have occurred where operations have been performed upon the gall-bladder or the viscera of the lower abdomen, and in the majority of these the venous return from the operation area was into the portal circulation. It seems, then, that the clot forms in the vena cava or its branches quite irrespective of the operation area, and that it is due to stasis in the great venous trunks rather than to any injury to contributory veins. It is a well-established fact that in almost all cases of pulmonary embolism the operation has been upon the abdomen or the lower limbs, and especially upon the pelvic viscera. It is suggested that the reason lies in the greater degree of immobility both during and after the operation than occurs in operation elsewhere. The position of the patient, and the pressure of retractors and packs, must tend to arrest the circulation in the inferior vena cava, and the interference with the action of the diaphragm will have the same effect. It seems probable that venous stasis is the most important predisposing cause of pulmonary embolism, and this would explain why anæmic patients are more prone to the condition, whilst in children it is practically unknown. The post-operative pneumonia of children is invariably of the broncho-pneumonic type.

There is no evidence to show, Mr. Lockhart-Mummery said, that sepsis plays any part in the occurrence of pulmonary embolism, except in so far as it may prevent movement or encourage the formation of intravascular clots. The great majority are clean cases with no evidence of sepsis at all. There must, however, be some other factor than stasis, for otherwise embolism would occur in paralysed persons, or even after normal sleep, and also we know by experiments that thrombosis does not occur with normal blood in a normal vein. The presence of thrombokinase is essential, but a certain quantity of this substance is liberated whenever a wound is made. Now it can be shown that thrombokinase produces clotting in intravascular blood only if the blood is stationary, and that it can be introduced

in large quantities into circulating blood without effect. It would seem, then, that the formation of the clot which gives rise to pulmonary embolism depends upon two factors—the liberation of thrombokinase and the presence of stasis. As regards prevention, it is advised that purgation and starving before operations be avoided, that operating tables be fitted with mattresses, that constrained positions during operations should be avoided, and that every effort be made after operation to maintain a satisfactory circulation in the trunk and lower limbs.

Discussion.

The discussion was continued by Sir CHARLES GORDON-WATSON (London), who pointed out that the incidence of embolism, far from being reduced by improvements in surgical technique, had actually increased. At St. Bartholomew's Hospital in 29,000 operations there had been 21 fatal cases of pulmonary embolism. The underlying cause was thrombosis in the large veins occurring soon after operation, and embolism was actually less likely to occur in mild sepsis, since the clots which formed were more firmly attached to the walls of the vessels. Sudden movement was often the immediate cause of displacement of the clot, and he described a case of wiring of the patella for fracture where the patient made a perfectly normal recovery, was wheeled to the lift in a chair, and died in the lift as the result of a pulmonary embolus, the thrombus having been displaced by the sudden movement of the lift. He thought that the factors in the production of the thrombi were the release of thrombokinase in the wound, injury to the deep epigastric, the uterine veins, or other tributaries of the inferior vena cava, and hæmorrhage into the tissues, with resulting pressure on the veins. Predisposing causes were loss of fluid, lowering of the blood pressure, and the effect of posture on the venous return. He advised gentle operating, careful hæmostasis, the avoidance of extreme postures on the table, and the early commencement of massage and movement after operation.

Prof. J. SHAW DUNN (Manchester) gave his own experience of seven cases of pulmonary embolism, in each of which there was found in the pulmonary artery a large cast of the iliac veins. The thrombus having left its site of origin there was, of course, no abnormality found in the vein from which it had presumably arisen, but projecting into this vein there was found in each instance a small tag of clot arising in a small tributary vein, and on tracing this clot along the tributary it was always found to lead to the site of operation. In each of these cases a very mild localised sepsis *was* present, and it was pointed out how often thrombosis in a vein is associated with neighbouring sepsis. Thrombosis of the lateral sinus is commonly associated with middle-ear disease, of the pelvic veins with sepsis of the uterus, of the portal veins with a septic appendix.

Prof. E. E. GLYNN (Liverpool), in a very remarkable communication, stated his belief that a large number of cases described as pulmonary embolism are really cases of pulmonary thrombosis. A close examination of the lungs often shows a localised thrombosis, even where death has been so rapid as to suggest embolism as the only rational explanation, the duration of life in his cases ranging from 10 to 20 minutes after the acute onset. That the thrombus was not only ante-mortem but of some age was shown by the fact that frequently the arterial wall had absorbed pigment from the thrombus, and that in one case the pigment from a large thrombus in the heart had spread into the cardiac muscle. In a large proportion of the cases a non-hæmolytic streptococcus was found to be present in the thrombus. He believes that these thrombi form in the pulmonary artery itself, remaining latent until the lumen of the vessel has been narrowed to an extreme degree, when some small change in the position or form of the thrombus precipitates the final catastrophe.

Mr. JAMES BERRY (London) considered that the surest way to produce pulmonary embolism was to undertake a pelvic operation, to do it roughly, to tie off large masses of tissue in the immediate neighbourhood of large veins, and to keep the patient recumbent for some weeks. He advised very early movement after all operations on the trunk and legs, starting with chest exercises next day, combined with a regular arm drill. Prof. Glynn gave details of such a system in the gynæcological wards at Liverpool, and stated that the mortality from pulmonary embolism had been reduced from 4 per cent. to 1 per cent. of the whole operative deaths, whilst the mortality from this in the surgical wards, where this method had not been then adopted, remained constant. Whether the original site of these clots be in the systemic veins or in the pulmonary artery itself, such a system of exercises must necessarily reduce the possibility of stasis and the accompanying risk of thrombosis and of embolism

FRIDAY, JULY 25TH.

On the third day, Mr. HAROLD BURROWS, Vice-President, being in the chair, Mr. T. P. DUNHILL (London) read a short paper on

Auricular Fibrillation occurring in Toxic Goitre.

In cases of exophthalmic goitre referred to him irregularity of the heart was a not uncommon symptom, and in a number of these cases electrocardiographic tracings had shown that auricular fibrillation was present. In such cases it seemed rational to remove a portion of the thyroid and thus relieve the heart from this source of toxin. One case of this kind was that of a woman who had been seriously ill for 12 months with an irregular pulse, a loud systolic murmur at the apex, and swelling of the legs. Tracings showed well-marked auricular fibrillation. The right lobe and isthmus of the thyroid gland were removed under local anæsthesia, and three weeks later two-thirds of the left lobe. Her pulse dropped to 72, she became perfectly well, and she has remained so whilst following a strenuous employment. In all cases it is necessary, the speaker said, to remove a large portion of the thyroid tissue, usually the whole of one lobe and two-thirds of the other, but even then the fibrillation does not invariably clear up until a course of quinidine has been given. This is, however, a drug to be used with caution and only under expert medical supervision. In a large number of cases the combination of operation with quinidine results in rapid and permanent cure. It is, however, necessary to recognise that patients may have auricular fibrillation associated with goitre, in whom the goitre is not the cause of the fibrillation. A presystolic murmur or a history of rheumatic fever may assist the diagnosis, and the toxæmia of the typical thyroid is not present. But in many cases symptoms of profound thyroid toxæmia leave no room for doubt, the rapid pulse, moist warm skin, and staring, restless eyes. An investigation of the metabolic rate may give information of importance. If a portion of the gland is removed hyperactivity will be shown by the masses of cuboidal or even columnar cells which have replaced the flat cells lining the acini of the normal gland. This change in the form of the cells he regarded as the essential feature in the histology of Graves's disease.

Mr. GEOFFREY KEYNES (London) read a paper on

Blood Donors.

He referred to the important place which blood transfusion has since the war taken in surgical procedures, and pointed out that for its proper performance an organised supply of suitable donors was essential. They are often required in an emergency, when it is only too likely to happen that a suitable donor of the appropriate group cannot be found. Extensive experience has taught that a healthy young man can part with 750 c.cm. of blood, or even more, without any immediate effect, and that after a short rest he can perform an ordinary day's work as if nothing had happened. Fainting is psychological and is due not to the loss of blood, but to apprehension of the small operation involved.

It has, in fact, been noted that after a few days the donor feels in better and more vigorous health than before, and that he may even put on weight. The most suitable individuals are healthy men between the ages of 20 and 40. Women stand the loss of blood worse than men, and from a greater deposit of subcutaneous fat it may be more difficult to reach a vein in them by direct puncture, as should always be done. Perfect health and the absence of such infections as syphilis and malaria is essential, and this is another argument against the chance donor. It is generally thought that donors of group IV. can be used indiscriminately for any recipient, but this is probably only an approximation to the truth. In cases such as pernicious anæmia it is better to use a donor of the same group as the patient, and it is therefore well to have donors of all the groups available. In private practice there is no difficulty in providing donors. Suitable men are to be found quite willing to supply blood whenever required for a reasonable reward, and some of the professional donors give blood at intervals of six or occasionally even three weeks without inconvenience. In hospital, unless some system of payment can be organised, we have to depend on such casual donors as relatives or other patients in the ward. It has to be noted that consanguinity is no guarantee of compatibility of blood. Medical men and nurses should never be used, both on general principles and because their conditions of life are rarely productive of robust health. If medical students are used payment should be insisted on, as it is most undesirable that a sense of moral obligation should be induced. The speaker suggested that a properly organised supply of volunteer donors should be formed outside the hospitals among healthy individuals anxious to give personal service to the sick. Such groups might be found among Red Cross workers, who by character, training, and physique are peculiarly suited to the purpose.

Mr. H. P. WINSBURY WHITE (London) read a paper on

Hydronephrosis.

He pointed out that it is a fairly common surgical condition, rarely diagnosed until a late stage has been reached. It is most common in women, and between the ages of 20 and 50. The classical symptoms are rarely seen, and often intermittent pain is the only symptom. Sometimes a tumour may be felt, varying in dimensions from time to time, but it is only rarely that its disappearance is accompanied by the passage of a large amount of urine. Frequency is a symptom not of hydronephrosis but of the infection which is likely sooner or later to occur. Hæmaturia, from pressure on a vein, is not uncommon. The only final diagnosis of the condition is by means of a pyelogram. The concave lower border of the renal pelvis becomes convex, and this is followed by dilatation first of the upper calyx and then of the lower and middle calyces. In some cases large amounts of residual urine, 200 c.cm. or more, may be withdrawn by means of the ureteric catheter. In extreme cases of ureteric obstruction and stenosis it may be impossible to pass a ureteric catheter, and pyelography may thus fail. But in these cases there is usually a palpable tumour. Bilateral cases of hydronephrosis occur, and in these great caution is necessary before any operative treatment is undertaken. Infection is generally to be regarded as a contra-indication to pyelography.

Mr. F. W. GOYDER (Bradford) read a paper on

Hare-lip and Cleft Palate.

In regard to the former, he considered that it was unwise and unnecessary to remove the prominent premaxillary segment. Should it appear that the strain on the suture line of the lip would be too great if both sides of the lip were sutured at once, it was perfectly possible to suture one side at a time, leaving an interval of two or three weeks between the operations. In this way excessive tension was avoided and in the end the pressure of the lip would bring the premaxilla back into place. A sliding operation on the septum was fraught with risk to the vitality of the premaxilla. In regard to cleft palate, he considered that too much stress had been laid on closure of the cleft and too little on the obtaining of clear articulation. For the latter it was essential that it should be possible to approximate the soft palate to the back of the pharynx, and in order to do this satisfactorily it was in some cases necessary to forego closure of the hard palate. The aperture left could, however, be easily closed by means of an obturator.

SECTION OF PUBLIC MEDICINE AND INDUSTRIAL DISEASE.

WEDNESDAY, JULY 23RD.

The Rôle of the General Practitioner in Preventive Medicine.

Dr. HERBERT JONES, the President, in his opening remarks, drew attention to the fact that this was the first annual meeting at which the public health service, as represented by the Society of Medical Officers of Health, had been formally admitted to the B.M.A. representative meeting and its Council, and that there was now reciprocal representation of the Association on the Council of the Society. The Association had concerned itself much with the interests of the public health service, but it and the Society had not always travelled along parallel lines. There had sometimes been a tendency to make a sharp distinction between curative and preventive medicine. In his opinion there should be no distinction, and this section ought to be able to indicate how the general practitioner and the medical officer of health can help each other. The first medical officers of health were of necessity drawn from the ranks of the general practitioner and their success was largely due to the fact that they were conversant with the difficulties of the general practitioner. For a long period the medical service of the Local Government Board was recruited from the ranks of medical officers of health, and thus obtained insight into the methods and idiosyncrasies of local governing bodies. The public health service was proud of its achievements, but it fully recognised the help given by the marvellous triumphs of the physician and surgeon and of the laboratory worker. They needed the complete and intelligent coöperation of the general practitioner and the medical officer of health. The aim of both was the welfare of the community, and in the words of a great English novelist, "What is life for if not to make the world less difficult for one another?"

The discussion was opened by Dr. PETER MACDONALD (York). Commenting on the dictum, "The first duty of medicine is not to cure disease but to prevent it," he said that if Sir George Newman had substituted "ought to be" for "is" all would have agreed, but as the words stood they were exactly the opposite of the practice of the past and of the present, for most practitioners devoted their lives to the cure of disease already there and not to its prevention. Preventive action taken by the general practitioner was, so to speak, unofficial. Why was this? The answer was obvious. Until recently the economic demand on the medical profession had been and still was for cure. Only within recent years had they begun to prevent, and still more recently had they been asked to prevent, and some of them paid to prevent. The receipt of their emoluments from people who were ill was a highly unstable proposition, and thus the club system arose as a semi-charity. The club system somewhat shifted the economic outlook. In 1912 the club system was enlarged on a grand scale into the National Health Insurance Medical Service, and thus incentives were given for preventive work which did not previously exist. He would deal with the present preventive activities of the general practitioner under several heads.

Early Treatment.—It was obvious that early treatment of one disease prevented others. The vaccina-

tion of contacts, the prophylactic administration of antitoxin for diphtheria and precautions against ophthalmia neonatorum were examples of what might almost be called early treatment, and naturally led up to advice on personal hygiene and protection of the other members of the family from disease.

How does the General Practitioner Fail to take Advantage of his Preventive Opportunities?—The answer is, he does not interest himself sufficiently in matters of bad environment which hinder his curing disease. Atmospheric pollution, bad housing conditions, bad work conditions, adulteration of food, alcoholic excess, all hinder cure and so become the concern of the general practitioner. The general practitioner could do much to stir up public opinion on matters like smoke pollution, which only existed owing to the ignorance and apathy of the community. The general practitioner ought also to educate public opinion on all matters of bad environment. At present the influence of the medical profession in Parliament and on local authorities was negligible.

Aims for the Future.—Houses built to live in are, generally speaking, not suitable to be ill in. To obtain the best from him the general practitioner must have hospitals in which to do more of his work. Childbirth was in every way better conducted in a nursing home than in a private house, and the nightmare of midwifery practice in a workman's cottage, with even two or three bedrooms, was good neither for the mother, the child, the doctor, nor the community. The provision of hospital beds in the country was grossly inadequate. In the second place, it was absurd that a medical service had been set up for the fathers, but did not include the mothers and children. If the National Health Insurance Service, which at present included one-third of the working-class people, were extended to the other two-thirds, the preventive aspect would be enormously increased. Thirdly, his knowledge of the work of pensions medical boards led him to the conclusion that this idea might be usefully applied to insured persons generally. The advantages of periodic examination of insured persons by boards would be great from the preventive point of view, but he was doubtful if public opinion was ripe for such a step.

Links between the General Practitioner and the Public Health Service.—He thought that in all the encroachments at present being made by the local and national public health authorities on the domain of the general practitioner, the maximum use should be made of the general practitioner by means of "part-time" service.

New Thoughts Influencing the Outlook on Health.—He had been interested in the writings of F. M. Alexander, H. C. Cameron, and W. A. Cochrane, pointing to the fact that health, physical and mental, depends upon a coördination of the whole body, which will make man largely superior to his environment, and for the general practitioner there will be a pre-eminent place in the application of such principles.

Discussion.

Prof. HAROLD KERR (Newcastle-on-Tyne) said the general practitioner's want of interest in preventive medicine was partly due to the fact that public health was not attractively put before medical students. From the point of view of the general practitioner the medical officer of health used to be regarded as "not a proper doctor," "a kind of genteel plumber," and more recently, "a patient-snatcher." Sir George Newman had laid emphasis on our ignorance of natural processes, and there was no doubt that applied physiology was inadequately taught. The family doctor was in a good position to recommend improvements in environment. Little troubles were important. For example, constipation was promoted by nasty privies. Local divisions of the B.M.A. might do much to educate public opinion. He believed in "part-timers." Many of the recent whole-time appointments were cul-de-sac jobs, but part-timers must take their work seriously. He found that general practitioners did not sufficiently encourage breast-feeding.

Dr. F. E. FREMANTLE, M.P., thought there would ultimately be a place for health specialists in the latest applied physiology. The general practitioner might have great influence on public opinion, but there was no proper organisation for backing up the public health service or making the weight of medical opinion felt in Parliament.

Dr. J. S. MANSON (Warrington) pleaded for sympathy with the difficulties of the general practitioner.

Dr. F. E. WYNNE (M.O.H. Sheffield) had to thank the general practitioner for recent help in dealing with outbreaks of small-pox and encephalitis lethargica. In Sheffield they employed a "part-time" staff at the maternity and child welfare centre with satisfactory results. The general practitioner had not yet been able to wean the public from that extraordinary fetish, the 6 oz. bottle of medicine.

Dr. H. B. BRACKENBURY (London) said the general practitioner was the only person in a position to deal with preventive medicine of the whole organism. The use of vaccines was likely to extend and the work of the general practitioner to become more and more of the nature of personal and domestic hygiene. It was also extending to hygiene of the workshop. An increasingly close association was needed between the staff of the M.O.H. and the practitioners. The general practitioner must be given his opportunity. He needed time and money to investigate early disease and give prophylactic advice. This could be obtained by raising the capitation fee and thus allowing him to do more work on a smaller number of patients.

Dr. J. R. KAYE (M.O.H. West Riding) stated that 37 general practitioners worked in the centres established by the West Riding County Council. During health week last year 154 general practitioners gave lectures. In order to secure early notification of disease he had found provisional notification a useful procedure.

Dr. DAVID MCKAIL (Glasgow) said the "part-timer" was not utilised in Scotland. There were none in Glasgow. He pointed out the disadvantages of inexperienced whole-timers, and went on to say that there was insufficient coördination between the work of health centres and that of the parish authorities.

Dr. LOCKHART STEPHENS (Warblington U.D.C.) said education was the keynote of preventive medicine. He believed that post-graduate courses in infant feeding for the general practitioner would do much good.

Dr. H. SCURFIELD asked who was going to carry out the new preventive midwifery. The new midwifery required more obstetrical skill and experience than emergency midwifery, and the general practitioner was doing less and less midwifery. It seemed to him that midwifery would fall into the hands of a panel of obstetricians, perhaps mostly women, who would act in coöperation, and not in competition, with the general practitioner.

Sir MALCOLM WATSON (Malaya) was surprised at the lack of unity in the profession at home. In 24 years they had made great progress in Malaya. They were now actually doing some antenatal work. Beriberi had been controlled, and cholera and small-pox abolished, because it was obvious to the employers that these diseases interfered with the work of the plantations.

Dr. CECIL WILLIAMS (Todmorden) said the school medical officer and the general practitioner ought to coöperate in the first line of defence against disease. Some agreement as to what should be required of any general practitioner booked for a confinement was long overdue.

Dr. N. R. RAWSON (Whitley Bay) said there was a want of coöperation on the part of the medical officer of health. The B.M.A. Division should act as the link.

Dr. J. HALL-EDWARDS (Birmingham) read a paper setting out what action the local authority might take in the control of cancer. He advocated the appointment of a committee in every large city to review periodically questions relating to cancer and to

consider what steps should be taken to meet the requirements of the public and the medical profession. The first of these steps was compulsory notification.

Dr. W. MITCHELL (i/c Electr. Dept., Bradford Royal Infirmary) considered that no man should be a specialist unless he had had some experience in general practice. He asked if cancer was less among Jews and Jewesses owing to the observance of the Mosaic law.

Dr. R. W. STOCKS (West Bromwich) believed that coöperation between general practitioners and the public health service in his district was promoted by the fact that he and his assistants on their appointment called on all the medical men in the district. It had been an advantage to bring public health subjects, such as the use of the Schick test, before the B.M.A. Division. "Part-time" work at the infant welfare centres had been discontinued at the request of the general practitioners.

The whole discussion indicated a very good feeling between the general practitioners and the public health services, and a desire for closer coöperation. Before the session closed a resolution was passed asking the Council of the Association to institute an inquiry as to the best means of applying the experience of the profession to the work of Parliament.

THURSDAY, JULY 24TH.

Diet and Public Health.

Dr. J. BOYD ORR introduced this subject with a paper descriptive of the research work recently done at the Rowett Institute, Aberdeen, of which he is director. He expressed the opinion that there is now sufficient knowledge and sufficient interest to make dietetics an important factor in preventive medicine. During the past two or three years there had been a tendency to regard the evil effects of deficient dietaries as being due chiefly or entirely to the want of vitamins. It was now being recognised, however, that the amounts and proportions of the inorganic elements of the diet were of fundamental importance to the maintenance of health. It was impossible to make an unqualified statement as to the absolute amount of any mineral needed in the diet because many factors influenced its absorption or excretion. For example, it had been shown that an excess of potassium in the diet caused an increased excretion of sodium, and that the potassium-sodium ratio in the diet affected the assimilation of calcium and phosphorus. An excess of magnesium also interfered with the utilisation of calcium and so on. The first line of defence against rickets was the adjustment of the mineral contents of the diet. It was probable that calcium deficiency was common in infancy and early childhood, and was not only an important ætiological factor in rickets, but also in many other diseases associated with defective nutrition. A deficiency of iron was likely to be found in young children restricted to a diet of milk and refined cereals. The possibility of the deficiency of iodine was also worthy of consideration. In laying hens they found that iodine seemed to have an influence on calcium metabolism. Fortunately, mineral deficiencies could be easily corrected by including in the diet food-stuffs the virtues of which are universally recognised. Thus milk, green vegetables, and certain fruits were rich in calcium; milk, egg-yolk, and the embryo and bran of cereals were rich in phosphorus; green vegetables and egg-yolk were rich in iron. The only certain sources of iodine were green vegetables and cod-liver oil. Fruits and vegetables had an excess of alkali and could be used to correct a diet which was too acid. In his opinion much of the beneficial effect ascribed to vitamins was really due to the minerals present in the substances given as a source of vitamins. Of course, the inorganic constituents of the diet were only one aspect of nutrition, and further factors not connected with the diet, such as sunlight, exercise, and psychological influences, had to be taken into account.

Dr. J. S. MANSON contrasted the robust and healthy appearance of men home on leave during the war and after the armistice with the deteriorated appearance and loss of weight of the same men within a year or so after their discharge from the services. He attributed the change to the inferior home dietary as compared with the service dietary.

In a paper on Diet Control as an Instrument of Public Health Progress, Dr. W. G. SAVAGE (M.O.H. Somerset) expressed a very decided opinion that there was no measure likely to yield a better harvest in the improvement of the health of the community than education of the people in sound food habits. Our people persisted in faulty dietetic practices because no adequate steps were taken to enlighten them. The pessimist would declare that this was not practicable. The same was said with regard to infant feeding and rearing, but this had been refuted in the last few years. The application of similar educational measures to the whole of the public could be accomplished with greater difficulty but probably with equal success.

Dr. ROBERT HUTCHISON (London) was not satisfied that deficient diet or prolonged illness in infancy had a permanent effect on the physique of the individual. Infants brought to death's door by congenital pyloric stenosis often developed into fine children later on. He thought a deficient diet about the time of puberty was more likely to have a permanent effect. He could not see that a defective diet after being discontinued was likely to leave permanent effects on the heart, nervous or digestive system, or on the resistance to disease.

Dr. J. B. SIMPSON (Golspie) thought the physique of the crofters in the Highlands had deteriorated as the result of a change of diet. Tea and white bread and jam had taken the place of porridge and milk.

Dr. H. SCURFIELD believed that the national physique could be greatly improved by a better dietary. He thought legislation was required to regulate the use of preservatives in food; to enable us to know what we were getting when we bought flour or bread; to prevent foods being sold under misleading names, and to control infants' starchy foods. He thought we should not tie ourselves down with shibboleths about "natural foods," &c., but apply the knowledge we possessed to determining the essential goodness of every food at present used by man. It was very important that we should concentrate for the benefit of the public on the points on which we were agreed. For example, we were practically unanimous as to the need for more milk, vegetables, especially green vegetables, and fruit. Such advice would be approved both by those who were doing research work on vitamins, by those who, like Dr. Orr, attributed great importance to the mineral salts, by dentists, and by the crusaders against constipation.

Dr. A. L. HOOPS (Malaya) said that beri-beri had been abolished in institutions by the prohibition of over-milled rice. It still existed and ravaged the general population because the labourers liked over-refined rice. Attempts to prohibit its use had led to riots. In the country districts, where under-milled rice, fruit, and vegetables formed the staple articles of the dietary, teeth were good, but in Singapore, where over-milled rice and white bread (with no milk) were in use, the children had very bad teeth. There was no rickets in Malaya, and this was attributed to the sunshine.

Dr. J. J. PATERSON (M.O.H. East Berkshire Combined District) referred to the huge experiment in starvation experienced by Austria. The results appeared to be marked indelibly on the school-children. One could guess the year of their birth from their appearance. Every third child had a goitre. Fats and natural foods were at one time almost unobtainable. Could these effects be corrected by time? He hoped some systematic effort would be made to keep medical records of the progress of this vast involuntary experiment.

Dr. ORR, in replying, said it was impossible to be dogmatic as to whether the lessened resistance to disease caused by a bad diet leaves permanent effects, or can be worked off by the substitution of a good diet. He agreed with Dr. Scurfield that it was very necessary for us to attain the utmost possible unanimity in our advice to the public.

Industrial Welfare.

The President, Dr. HERBERT JONES, in opening the discussion, referred to the pioneer work of Josiah Wedgwood (who provided houses and an open-air swimming bath for his employees) and gave the following apt quotation from his biographer: "To be comfortable himself he must know that those around him were comfortable also. To be happy he must impart happiness to others even to the most lowly of his employees. To sit at ease in his own new home he must know that those he employed were well and cosily housed. He therefore set about building a village for his workmen and their families." Wedgwood's works were established in 1767.

Dr. W. F. DEARDEN (M.O.H. Port of Manchester and Certifying Surgeon) contributed a useful paper, giving an epitome of the multifarious activities included under the term "industrial welfare work." The war had been a great stimulus to this work. If properly applied industrial medicine could bring about an immense saving in lost time through industrial convalescence and through the better suiting of a worker to his job. There would, perhaps, never be the same demand for whole-time works doctors as there was in America, although he had no doubt that industrial welfare work had come to stay, and that there was a great future before it.

Dr. MCKAIL said that for adult men good working conditions and wages were the chief need. For young persons and women at all ages industrial welfare was a necessity. For boys and girls an officer was needed to make adjustments in their working conditions. The elder children of a working-class family were especially likely to be under-fed, and needed careful supervision.

Dr. G. T. WILLAN (Carr and Co., Carlisle) said a whole-time works doctor was good for a medium-sized firm like his, which employed from 2500 to 3000 workers. At first his appointment was viewed with suspicion by the panel doctors, but they soon found there were no grounds for that view. By immediate treatment of illness and slight injuries, employees were prevented from going on the sick list. If they had to go sick a note was sent to the panel doctor. A works doctor was no good without a proper welfare department. The system reduced absenteeism, promoted good feeling, and filled the gap in medical supervision between the ages of 14 and 16. There was a great decrease also in compensation, and it was frequently possible to find suitable jobs for injured workmen who, without such a system, would be off work for prolonged periods.

Dr. T. W. SINCLAIR (Melbourne) was impressed with the arrangements made in some of the American factories for recommending sound dietaries to their employees. Sometimes also there was a free distribution of milk.

Mr. GEORGE ARMSTRONG (Bradford Dyers Association) said the Runciman Act of 1910, with regard to choice of employment, was not properly worked. The Day Continuation Schools Act of 1918 was not yet in operation. Many a boy obtained employment who was not physically fit for it, and many a man was not properly fed for his job. Diet was very important. The health records were not yet transferred from the schools to the factories. In this movement it was essential to have the workers with them.

Miss SHUTE (Listers, Bradford) said the 14 to 16 year olds were a great difficulty. The child comes to work in good health but great physical deterioration takes place in the next three years.

Mr. REGINALD J. MCKAY (Bradford Dyers Association) mentioned that at one of their Bradford works a new ophthalmic service had been instituted. The firm provided plain glasses, and if the workers wanted more elaborate ones they paid the difference. As an example of the need for this service they found that in the past they had spent futile years in trying to train colour-blind workers. There was a considerable movement for vocational and psychological tests. There must be coöperation as to the medical and psychological examinations.

Dr. J. J. ROBB (Bournville) said there was a tendency in America now to realise that one may overcoddle. Only a small percentage of the employees took advantage of the playing fields and facilities for recreation. In some way the factory doctor must be made independent of the firm in order to get the best results. The independence of the worker must be encouraged. Industrial welfare work should be a national responsibility. The worker is fearful of becoming a mere cog in the machine.

Dr. T. WATTS (Manchester) regretted that compulsory industrial welfare had not been included in the new Factory Bill.

The trend of the discussion was to emphasise the importance of, and great future before, the movement, coupled with a note of warning against over-paternalism. A noteworthy feature of the discussion was the part taken in it by the trade representatives.

SECTION OF ORTHOPÆDICS.

FRIDAY, JULY 25TH.

THIS section met on one day, with the President, Mr. R. C. ELMSLIE, in the chair, to discuss the

Treatment of Hallux Valgus and Rigidus.

Sir ROBERT JONES (Liverpool), who opened the discussion, referred first of all to some points in the ætiology of the disabilities under consideration. In his opinion, boots were the exciting cause of the vast majority of cases of hallux valgus. He contrasted the primitive foot as seen in the infant, or the adults of barefooted races, with the foot of the average civilised individual. In hallux rigidus, whilst static causes might operate in the production of the deformity, injury was usually a dominant ætiological factor. Patients rarely sought aid because of deformity alone, but usually owing to progressive pain and discomfort. On careful examination the actual causes of the pain complained of were found to vary in different individuals—e.g., (*a*) inflammation of the bursa, (*b*) arthritis, (*c*) osteophytic pressure on the digital nerves, (*d*) callosities under the joint. An appreciation of such distinctions was necessary in order that appropriate treatment might be applied.

Treatment of hallux valgus was considered under three heads: (1) Preventive.—When a patient asked for advice in the postural stage of the deformity, he was instructed to wear shoes built on correct lines. Operative treatment was rarely if ever desirable for æsthetic reasons alone. (2) Mechanical.—It is essential to relieve the joint from pressure and this could be ensured by the simple device of placing a transverse bar of leather across the sole just behind the metatarso-phalangeal range. In addition it is advisable to tilt the inner border of the heel as in the case of simple flat-foot. Where the bursa was inflamed complete rest was prescribed. In many patients conservative methods brought about the relief of the major symptoms, and operation was not required. (3) Operative.—The choice of the operation should be decided by the special circumstances of the case. In the milder cases simple division of the joint capsule and the extensor proprius hallucis tendon, with or without cuneiform osteotomy of the neck of the metatarsal, would often suffice. Where the symptoms were entirely referable to the bursa, exsection of the sac and the underlying exostosis was necessary. Excision of the head of the metatarsal was an operation of great value, which should be reserved for patients of middle age with arthritic changes, but in exceptional circumstances might be practised in younger individuals. In the latter the weight-bearing portion of the head should always be left. Resection of the base of the first phalanx was an operation which might be regarded as a valuable alternative.

Treatment of hallux rigidus.—For this condition the operation of choice was removal of the base of the first phalanx. After all operations it was

necessary to give a period of treatment directed towards the development of the musculature of the foot.

Mr. E. LAMING EVANS (London), who followed, laid stress on the importance of focal sepsis as an ætiological factor in hallux valgus. He advocated, and practised regularly, the operation of excision of the metatarsal head. There was no interference with the stability of the foot if the stump of the neck was brought to rest on the sesamoid bones. Mr. Evans regarded the post-operative re-education of the foot musculature as an essential part of the treatment.

Mr. D. MACRAE AITKEN (London) supported the view that the deformation began in early life and was due to static errors. Contrary to general experience he had found that the operation of cuneiform osteotomy of the neck of the first metatarsal was followed by good results.

Mr. NAUGHTON DUNN (Birmingham) agreed that it was necessary to institute a careful inquiry as to the exact causation of the pain. He recognised two main types of case: (*a*) Where the pain was due to pressure; in these, trimming of the metatarsal head was sufficient. (*b*) Pain due to joint movement only. Here he practised excision of the metatarsal head, or of the base of the phalanx, according to the age of the patient.

The PRESIDENT expressed his belief that compression of the forefoot in improper shoes was the outstanding factor in the ætiology of hallux valgus and rigidus. Re-education of the smaller foot muscles was therefore an integral part of all treatment. In the choice of an appropriate operation, every case had to be judged on its merits. In his experience the best results had followed complete excision of the metatarsal head, or in less severe cases, trimming of the head. After this operation the foot should always be strapped so as to support the anterior metatarsal arch.

Mr. P. BERNARD ROTH (London) emphasised the part played by the following ætiological factors:—(1) tight socks in children; (2) trauma; (3) heredity; and (4) infection. He favoured the operations of simple trimming of the metatarsal head or complete excision.

Mr. W. ROWLEY BRISTOW (London) stated that a survey of the results of the cases operated on in his clinic had shown that excision of the metatarsal head gave exceedingly good functional results. He was less satisfied with the results obtained after the operation of simple trimming.

Dr. G. HOLMES (Harrogate), who confined his remarks to conservative treatment, laid emphasis on the value of paraffin baths for the subjective symptoms of pain and discomfort.

The Operative Treatment of Arthritis Deformans of the Large Joints.

Mr. HERBERT FRANKLING (Harrogate) read a short communication on the results obtained in a personal series of operations on the hip- and knee-joints in cases of arthritis deformans. The cases were carefully chosen and the operations were conducted only after a long period of medical treatment. He stated that it was important to approach each operation as an exploratory procedure with no fixed routine in mind, the actual technique being determined after a careful inspection of the interior of the joint had been made. His results had been carefully analysed and it was gratifying to know the degree of comfort and mobility which had developed in a number of cases after comparatively conservative operative measures.

Acute Arthritis of the Hip.

Mr. S. T. IRWIN (Belfast) described a series of cases of acute arthritis of the hip-joint in which mechanical problems of considerable difficulty were presented in the later stages. He pointed out that if in this condition and similar acute infections early correct splinting and postural treatment had been employed, many of the later difficulties would never have arisen.

Lesions of the Ulnar Nerve in the Region of the Elbow.

Mr. HARRY PLATT (Manchester) dealt with some points in the pathogenesis and treatment of certain forms of ulnar nerve lesion in the region of the elbow, which he divided into three classes: (1) Lesions associated with recent fractures of the lower end of the humerus. An ulnar nerve lesion accompanying a fracture of this type was an uncommon complication, and usually was a transitory phenomenon. If the signs of severe neuritis persisted operation was indicated, and the nerve should be displaced to the front of the elbow. (2) Late involvement of the ulnar nerve. For this condition, in which various types of reconstructive operations had been practised, the operation of anterior transposition of the nerve was also effective. (3) Recurring dislocation of the nerve. Here again the operation of anterior transposition should be regarded as a routine procedure.

EXHIBITION OF INSTRUMENTS, DRUGS, FOODS, AND APPLIANCES.

BRIEF mention has already been made of the very varied and complete exhibition of surgical instruments, appliances, drugs, foods, and other objects of medical interest, which was held in the Windsor Halls, Morley-street, Bradford, from Tuesday, July 22nd, until Friday, July 25th. The educational value of such an assemblage was the subject of Mr. Basil Hall's remarks when, as President of the Association, he opened the exhibition, and the attendance throughout the week showed that his view was taken by many of those who were attending the meetings.

SURGICAL INSTRUMENTS AND APPLIANCES.

The exhibit of surgical instruments, general and special, was as full and instructive as in recent years, with a number of ingenious contrivances of the last 12 months added. [49] Allen and Hanburys, Ltd. (Bethnal Green, London, E.C. 2): an extensive surgical exhibit, including a model of the new St. Bartholomew's Hospital pattern operation table, the minimum height of which has been reduced to 32 inches, and which includes a new arm-rest for support during removal of axillary glands, and an arm-support for use in the kidney position. Among other recent models were the latest pattern of Boyle's gas, oxygen, and ether apparatus, insulin syringes as made for Dr. Leyton, the newest forms of blood-transfusion apparatus, and sets of electrically illuminated diagnostic instruments.—[6] Arnold and Sons (John Bell and Croyden, Ltd., 50, Wigmore-street, London, W. 1): an improved operation table, at a moderate price, on an oil-pump base, the whole control of which is from the head end of the table, within the surgeon's easy reach; also a new self-retaining abdominal retractor, designed by Mr. H. B. Devine, of Melbourne, giving an extensive view of the field of operation.—[44] Down Bros., Ltd. (21, St. Thomas's-street, London, S.E. 1): a large and representative collection of surgical instruments and appliances, including recent introductions and modifications suggested by surgeons, many of the instruments being made in stainless steel—e.g., Childe's crushing clamps and forceps; Fraser and Dott's guillotine for aseptic intestinal anastomosis; Ryle and Einhorn's tubes for gastric and duodenal analysis; instruments for lung surgery by Duval, Tuffier, and de Quervain. —[27] The Holborn Surgical Instrument Co., Ltd. (26, Thavies Inn, London, E.C. 1): an exhibit covering most branches of modern surgery, of special interest being a pocket record syringe to be readily carried about, sterilised in a water-tight container, and a simple and ingenious form of pantoscope,

both listed at very moderate price.—[25] Mayer and Phelps (59, New Cavendish-street, London, W. 1): a selection of instruments and apparatus of original design for general and regional surgery, including a very practical form of blood-pressure outfit with arm-band and dial; and Daniell's apparatus for administration of warmed ether vapour. An extremely rigid operating table by this firm is on view at the Wembley Exhibition. Point was made of an absolutely boilable silk of unbleached fibre.—[54] Reynolds and Branson, Ltd. (Leeds): a large exhibit of special instruments, including those used by Sir Berkeley Moynihan in abdominal surgery, most instruments being in stainless steel, not excepting the knives themselves. A set of apparatus and solutions designed for the use of the general practitioner in the diagnosis of glycosuria and diabetes.—[24] C. F. Thackray (Gt. George-street, Leeds, and 119, High Holborn, London, W.C. 1): a collection of abdominal and surgical instruments, including Rufus Harris's extension apparatus with a spring balance up to 25 lb. applicable to any Thomas's splint, obviating the use of pulleys and uprights, and not pinning the patient down to the bed.—[2] John Weiss and Son, Ltd. (287, Oxford-street, London, W. 1): besides a complete display of instruments, including many new and original designs, a very practical projection lamp for throwing on the screen any microscopic slide and giving a 7-foot disc in a dark room with an ordinary wall-plug attached to a lighting circuit. Also a new epidiascope with no filament.

Among the special instruments:—[15] Ajax Electro-Medical Apparatus (117, Central-street, London, E.C. 1): with special emphasis on a new sinusoidal generator requiring only a little water from the tap to render it capable of furnishing a wide range of currents for treatment.—[20] Ardente Acoustique (Mr. R. H. Dent, 95, Wigmore-street, London, W. 1): in addition to a series of apparatus for the relief of deafness characterised by absence of adventitious sounds and metallic timbre, a stethoscope specially designed for doctors suffering from deafness, and a church installation rendering it possible for deaf people to hear the service from any part of the building.—[3] The Dowsing Radiant Heat Co., Ltd. (91, Baker-street, London, W. 1): the latest form of apparatus for giving radiant heat treatment by means of luminous rays, with a bed of new design and simpler construction.—[36] The Genito-Urinary Co., Ltd. (64, Great Portland-street, London, W. 1): a selection of cystoscopes, urethroscopes, bronchoscopes, œsophagoscopes, of various types, including the latest improvements and the inventions for diagnosis and treatment associated with the names of Thomson-Walker, Swift Joly, Frank Kidd, A. C. Morson, and others.—[32] Theodore Hamblin, Ltd. (15, Wigmore-street, London, W. 1): a number of ophthalmic instruments, including a new luminous Morton ophthalmoscope to be used with both the direct and indirect methods, and a new prismatic binocular loupe giving a large flat field with three magnifications.—[43] Rayner and Keeler, Ltd. (dispensing opticians in London, Bradford, Liverpool, Leamington, and other towns. Works: Kemp Town, Brighton): a luminous ophthalmoscope with standard Morton body and improved May type of illumination; an operating lamp with triple beam mounted on adjustable sling support; and a new fitting of the Moorfields lamp giving an intense beam for needling which can be used also as a slit lamp.

Besides those firms mentioned as supplying dressings:—[47] Antiphlogistine (Denver Chemical Manufacturing Co., London, E.C. 3): the well-known hygroscopic antiseptic poultice for use in inflammatory and congested conditions both superficial and deep-seated.—[34] Thermogene Curative Wadding (The Thermogene Co., Ltd., Haywards Heath, Sussex): a scientifically prepared cotton-wool impregnated with various medicinal essences, intended to stimulate gently the circulation in the affected part.

DRUGS AND PHARMACEUTICAL PREPARATIONS.

The collection of drugs and pharmaceutical preparations was, as usual, large and representative, containing for the most part new and improved forms of well-tried remedies rather than a host of new synthetic drugs. [49] Allen and Hanburys, Ltd. (37, Lombard-street, London, E.C. 3): the pharmaceutical section of this firm's exhibit included insulin A.B. brand, with a special set of apparatus and reagents for the estimation of blood-sugar by Maclean's method; the various forms of Allenburys foods for infants, and diabetic flour; numerous polyglandin preparations and osmokaolin prepared by electro-osmosis, in colloidal form, for the treatment of intestinal toxæmias.—[55] Boots Pure Drug Co., Ltd. (Station-street, Nottingham): amongst a large exhibit of fine chemicals, tablets, pastilles, tinctures, were specially to note insulin, acriflavin, stabilarsan, and chloramine T. Details were available of the strict system of analyses made by expert chemists in the firm's laboratories before the use of any raw material, of the running control during manufacture, and examination after packing.—[46] C. J. Hewlett and Son, Ltd. (35, Charlotte-street, London, E.C. 2): a number of well-established original preparations, including deliciol, a coloured and flavoured soft paraffin; evapogens, a medicated evaporating skin lotion; iodermiol, a non-irritating preparation of iodine; and Dr. Crofton's human tubercle bacillus solution on which demonstrations were being given.—[56] The Hoffmann La Roche Chemical Works, Ltd. (7, Idol-lane, London, E.C. 3): besides the well-tried sedobrol, in tablet form for preparing a hypnotic bouillon, and omnopon in various forms, a new non-narcotic, non-habit-forming hypnotic and analgesic was shown bearing the name allonal, coming with recommendation from the Jefferson Medical College, and spasmalgin, a combination of omnopon, papaverin and atrinal, for relieving pain in dysmenorrhœa and colicky conditions.—[38] Oppenheimer, Son and Co., Ltd. (179, Queen Victoria-street, London, E.C. 4): besides the palatinoids, bipalatinoids, pulverettes, and various roboleine compounds, an oxygen generator and oxinhalator, providing oxygen gas from chemical cubes in a high state of purity, for use in country districts and under circumstances where cylinders of compressed gas are not available.—[50] Parke, Davis and Co. (50, Beak-street, Regent-street, London, W. 1): in addition to a large variety of pharmaceutical and toilet preparations, bacterial vaccines prepared in the Department for Therapeutic Inoculation at St. Mary's Hospital, anti-diphtheritic serum containing 1400-1500 units per c.cm, Dr. Owen F. Page's tuberculin insufflation outfit, as well as hæmoplastin, a sterile fluid for venous injection, reducing the coagulation time of the blood.—[54] Reynolds and Branson, Ltd. (Leeds): among a large exhibit in this class, concentrated emulsions for making medicated waters more cheaply than on a spirit basis; unguentum sedativum R. & B., a healing and antiseptic ointment containing calamine and pitch, of proved utility in many skin affections.—[4] Sandoz Chemical Co., Ltd. (Canal-road, Bradford): scillaren, femergin, felamine, and ipecopan in tablet form, as well as a useful dietetic and digestive biscuit known as matinol, incorporating highly refined petroleum to the extent of some 20 per cent., an elegant regulative medium.—[14] E. R. Squibb and Sons (80, Beekman-street, New York): thromboplastin, a lipoid prepared from the brain of the ox, by Dr. A. F. Hess's method; and thyroxin, a physiologically active ingredient of thyroid, containing 65 per cent. of iodine.—[40] W. A. Wharram, Ltd. (34, Lady-lane, Leeds); a series of popular pepsin preparations, the digestive ferment being combined in various ways with bismuth, nux vomica, strychnine, iron and aromatics; various elixirs including a cardiac tonic, luminal, compound senecio and viburnum; and a number of original mixtures and

syrups.—[29] Wyleys, Ltd. (Coventry): among other pharmaceutical specialities, an emulsion of acetyl-salicylic acid, 5 grains to 1 drachm, pleasant to take and acting quickly, and a compound theocin mixture, containing 1 grain of theocin-sodium-acetate to the drachm.

A number of special pharmaceutical preparations were shown. [48] Armour and Co., Ltd. (Queen's House, Kingsway, London, W.C. 2): beef cubes, claimed to have a more intensive beef flavouring than any other cube on the market, and an exhibit of endocrines comprising tablets, capsules, powder and liquids, including a pituitary liquid prepared to a physiological standard.—[23] Crookes' Collosols (The Crookes Laboratories, 22, Chenies-street, London, W.C. 1): in additon to argentum, bromide, calcium, ferro-malt, iodine, kaolin, and sulphur in a colloid form, also collosol ichthyol in ointment and capsules, obtained solely from British shale.—[35] J. C. Eno, Ltd. (Victoria Embankment, London, E.C. 4): the well-known effervescent saline laxative, containing no crude mineral substance and free from sugar.—[51] Genatosan, Ltd. (Loughborough): nasmin, a germ-killing snuff; sanatogen, the well-known tonic food; formamint, to combat mouth and throat ailments; and a collection of detoxicated vaccines claimed to be 50 to 100 times less toxic than ordinary vaccines.—[53] Jeyes' Sanitary Compounds Co., Ltd. (64, Cannon-street, London, E.C. 4): preparations of cyllin, a non-irritant and non-caustic antiseptic with a Rideal-Walker coefficient for *B. typhosus* of 22 to 26; also a form of lysol (jeysol) for use when a clear solution in water is required.—[18] The Anglo-American Oil Co., Ltd. (Albert-street, Camden Town, London, N.W. 1): nujol, an intestinal lubricant manufactured to a standard viscosity, approved by clinical and chemical tests; and mistol, an oily solution for use in an atomiser along with camphor, menthol or eucalyptol.

Apart from the firms already mentioned, toilet preparations were shown by: [42] Kolynos, Incorporated (Chenies-street, London, W.C. 1): an antiseptic dental cream not interfering with the normal secretions of the mouth and free from grit.—[22] The Pepsodent Company (42, Southwark Bridge-road, London, S.E. 1): a dentifrice containing mildly acidic calcium salts stimulating the secretion of saliva; and the decoater tooth-brush designed for use therewith, in convenient pocket forms for travelling.

FOOD PREPARATIONS.

Foodstuffs and food accessories were represented by a large number of separate exhibits. [59] Cadbury Bros., Ltd. (Bournville, Birmingham): the usual exhibit of Bournville cocoa and chocolates, conforming to the highest standards of purity and uniformity.—[13] Food Education Society (329, Vauxhall Bridge-road, London, S.W. 1): publications on dietetics and hygiene, including The Gateway of Health, Facts for Patriots, Feeding of Children, Diet in Pregnancy, and a new pamphlet on Puddings and Porridge. The Society, which is undogmatic and philanthropic, sets out to educate the public in matters of food, cookery, and health.—[26] Food Products, Ltd. (11, Queen Victoria-street, London, E.C. 4): an exhibit of bovo-lactin in various forms, a product rich in assimilable animal protein, iron, and with a high vitamin content. Diluted with soda water it is recommended as a refreshing and stimulating drink for summer sports such as tennis.—[67] William Gaymer and Son, Ltd. (Attleborough, Norfolk): various brands of Gaymer's cyder, prepared from Norfolk apples, including the original "dry" brands which have received favourable medical comment.—[57] Glaxo (J. Nathan and Co., 56, Osnaburgh-street, London, N.W. 1): standardised dried milk products, including Prescription Glaxo, a new humanised form with a normal fat, low protein, and high carbohydrate content, particularly suitable in the early weeks of infant life and in cases of difficult assimilation, malnutrition, constipation, and so forth. When reconstituted with hot boiled water, 1 in 8, a milk is obtained with protein content as low as that of human milk—namely, 1·7 per cent. A report is available from a London hospital where since December, 1923, 15 infants have been fed upon it with satisfactory results. In no case did the milk cause vomiting, diarrhœa, or constipation, and in no case did the infants fail to gain in weight.—[45] Horlick's Malted Milk Co. (Slough): recommended as an ideal food from infancy to age, and as filling a useful place in Red Cross work for the ease with which it is prepared; also available in the form of food tablets.—[52] Milkal, Ltd. (31, St. Petersburgh-place, Bayswater, London, W. 2): a dried milk produced in a modern creamery from milk of Devonshire herds, under the supervision of inspectors, the drying being controlled by qualified chemists. The powder does not contain pathogenic organisms, and the number of other organisms remaining is low. It is claimed that there is hardly any coagulation of albumin, and that the calcium-casein balance is undisturbed.—[63] Numol, Ltd. (Newcastle-on-Tyne): a dietetic preparation containing malted carbohydrates, proteins, fat, lecithin, glycerophosphates, hypophosphites, diastase, and lemon; originally known in northern hospitals as "extractum nutriens," and containing 12·5 per cent. of animal fat. Also a non-irritant, non-poisonous antiseptic known as soloform, with the formula $C_6H_2I_3OH$, which can be used undiluted and is available in special form for immediate sterilisation of surgical instruments.—[30] Oxo, Ltd. (Thames House, Queen-street-place, E.C. 4): Oxo fluid beef, being a concentrated form of stimulating extractives together with easily digestible constituents of fresh, lean beef, seasoned ready for use, as well as Lemco, a pure unseasoned beef extract and beef essence for invalids and convalescents; also Oxoid brands of gland extracts, including thyroid, pituitary, and adrenal, in tablet form.—[33] Prideaux's Pure Casein Co., Ltd. (16, Southwark-street, London, E.C. 1): the Dorsella milk food, described as modified full-cream milk dried within a few hours of milking, with the addition only of lactose; half-cream milk powder for special prescription is also supplied. Casumen contains nearly 90 per cent. of casein and is completely free from starch and sugar.—[28] Virol, Ltd. (Hanger-lane, Ealing, London, W. 5): containing fats, carbohydrates, and proteins in well-balanced proportions and abundance of vitamins not destroyed in the process of manufacture; also virolax and the new virol and milk in golden powder, combining the properties of virol with full-cream Devonshire milk, and recommended for nervous and mental fatigue and for athletes in training.

MEDICINAL AND MINERAL WATERS.

[60] Bath (Mr. John Hatton, Director of Baths): an exhibit of photographs of the bathing establishments and water-colours of features of interest in and around Bath, with a special reference to the coming annual meeting of the Association at Bath in 1925.—[21] Droitwich (Mr. J. H. Hollyer, Joint General Manager of Bathing Establishments): a spa dependent for its therapeutic claims upon natural water only, the heavy brine constituting the strongest saline water known and facilitating the movements of immersed limbs; highly radio-active and radio-emanative.—[39] Harrogate (Mr. F. J. C. Broome, General Manager): unique in the diversity of its springs, with 87 waters each possessing distinctive characteristics, and under the supervision of a permanent scientific officer and analyst. The bathing equipment was visited by many members during the annual meeting of the Association.—[58] Ingram and Royle, Ltd. (45, Belvedere-road, London, S.E. 1): samples of imported natural mineral water, salts, and pastilles, including Vichy-Celestins, Contrexéville-Pavillon, Evian-Cachat, Hunyadi-János, Carlsbad sprudel salt, and 22 others.

MICROSCOPES AND SCIENTIFIC APPARATUS.

[19] Baird and Tatlock, London, Ltd. (14, Cross-street, Hatton Garden, London, E.C. 1): an impres-

sive exhibit of autoclaves, incubators, centrifuges, sterilisers, glass apparatus, stains, and media, including apparatus for determination of sugar in blood, Harris's air analysis, and an all-British Benedict metabolism apparatus.—[9] C. Baker (244, High Holborn, London, W.C. 1): a collection of microscopes and accessories to meet the needs of the student, advanced student, and research worker; also a new corneal magnifier and illuminator, with possible application to other clinical purposes.—[10] F. Davidson and Co. (29, Great Portland-street, London, W. 1): a variety of optical and electro-medical appliances and portable outfits for examination of the ear, nose, and throat, trans-illumination and cautery; also a new pharyngoscope on the principle of the cystoscope.—[7] Chas. Hearson and Co., Ltd. (47, Mortimer-street, London, W. 1): sole agents in Great Britain for Reichert microscopes and accessories; in addition to bacteriological apparatus, such physiological apparatus as kymographs, recording drums, respirator pumps, time-marking clocks, myographs, hæmocytometers, and so forth. This firm submits designs and carries out manufacture of apparatus for new experimental work.—[5] Kodak, Ltd. (Kingsway, London, W.C. 2): showing duplitised X ray films, positive prints on nikko-bromide paper, and reduced transparencies on Eastman commercial film; a series of very beautiful radiograms.—[62] Ronuk, Ltd. (Portslade, Sussex): materials and appliances employed in the preparation, initial polishing, and maintenance of floor and other interior woodwork by improved sanitary methods.—[65] Short and Mason, Ltd. (Aneroid Works, Walthamstow, London, E. 17): the Tycos sphygmomanometers, calibrated to standard readings and self-verifying.

MEDICAL AGENCIES.

[1] The Medical Charities: Royal Medical Benevolent Fund and Epsom College.—[37] The Medical Insurance Agency (429, Strand, London, W.C. 2): founded in 1907 to persuade medical men to protect themselves by means of insurance against adverse fortune and unsatisfactory contracts, and to assist the medical charities.—[11] The Medical Sickness, Annuity, and Life Assurance Society, Ltd. (300, High Holborn, London, W.C. 1): founded in 1884 as a mutual society of medical and dental practitioners, with the object of obtaining sickness, accident, and life assurance on better terms than are offered by proprietary companies.

BOOKS AND OFFICE ACCESSORIES.

[31] H. K. Lewis and Co., Ltd. (136, Gower-street, London, W.C. 1): an exhibit of new and important books in many branches of medicine, including those of the Cambridge University Press; additions to the stock of medical stationery—e.g., new cards for X ray treatment and electrical treatment in the card index system. The printed library catalogue has been kept up to date by two supplements, 1918–20 and 1921–23.—[16] The Oxford University Press (Warwick-square, London, E.C. 4): a set of the Oxford Medical Publications, comprising text-books and works on medical, surgical, and allied subjects, and several recent and important additions.—[12] Stanley Phillips (45, Brondesbury-road, London, N.W. 6): a collection of the latest publications of Messrs. F. A. Davis Co., Philadelphia, E. and S. Livingstone, Edinburgh, and Cassells, London; including the Practical Medicine Series of Year-books on general medicine, surgery, and special subjects.—[64] W. B. Saunders Company, Ltd. (9, Henrietta-street, London, W.C. 2): a number of new books and new editions, including Pædiatrics by 150 authorities; Operative Surgery, edited by W. S. Bickham, in four volumes, and other standard books.—[17] Tapp and Toothill, Ltd. (Bradford): a set of office indispensables, including the ingenious Bates rotary telephone index.—[41] John Wright and Sons, Ltd. (Bristol): a series of new publications, including Epidemic Encephalitis, by Prof. A. J. Hall; Diseases of the Nose, Throat and Ear, edited by Dr. A. Logan Turner; and new editions of standard medical works.

Corrigendum.—In our report of the Section of Ophthalmology (THE LANCET, August 9th, p. 295, col. 1, five lines from the bottom) the sentence should read: "The beam should be directed at a suitable angle so as to avoid the *specular reflection from the* corneal epithelium."

Correspondence.

"Audi alteram partem."

THE VIRUS OF FOOT-AND-MOUTH DISEASE.

To the Editor of THE LANCET.

SIR,—The photographs of the colonies and of the individual organisms of the virus of foot-and-mouth disease reproduced in THE LANCET of August 2nd will no doubt be of interest to many workers in bacteriology and allied sciences. In common with most English references to this recent discovery, the description you give is not quite accurate. The photo-micrographs have been obtained by using ultra-violet light as an illuminant, but the apparatus used is not the ultra-microscope as might be inferred from your article. An ordinary type of microscope was used, but it is fitted with objectives and condensers of quartz. The light source is provided by passing a high tension electric discharge between cadmium electrodes, the desired wave-length in the ultra-violet (275 $\mu\mu$) being isolated spectroscopically.

No doubt the similarity of the terms "ultra-violet microscopy" and "ultra-microscopy" has led to some confusion, but the purpose of the two methods is widely different. The terms themselves are perhaps open to objection, but as they are in general use and are recognised by microscopists as applying to different branches of work, it is difficult to alter them. Any confusion in their use is probably due to failure to appreciate that there are two distinct microscopical methods. In one the aim is to obtain the utmost resolution, in the other to obtain the greatest visibility. Resolution is dependent on the wave-length of the light used and on the numerical aperture of the objective, whereas visibility is mainly dependent on the intensity of the illuminant. Resolution is the desideratum in all ordinary observational work with the microscope and the use of ultra-violet light comes within this category, although the image itself is invisible and has to be recorded photographically. The difference between the use of white light in which the dominant wave-length is of the order of (say) 550 $\mu\mu$ and ultra-violet light of wave-length 275 $\mu\mu$, is that resolution is doubled, such increase of resolution proceeding regularly as the wave-length used is reduced. Thus objects of half the size of those seen by white light may be satisfactorily shown.

The organism of foot-and-mouth disease is presumably of the order of size that can be photographed in ultra-violet light (about 0·1 μ), while it would be impossible to resolve it by any method in which white light is used. The method has other and perhaps even greater advantages for biological work, as organisms do not require any preparation before being photographed; they can be dealt with in the living state. Now the ultra-microscope secures increased visibility, and there is no theoretical limit to the size of an isolated object that can be made visible by this means; it is in general merely a question of whether the object can be made sufficiently luminous to be seen. The light used is therefore of high intensity, usually an arc-light or sunlight, and illumination is at right-angles to the direction of observation. The image obtained of a small particle is a circular disc of light giving no indication of its shape or size. It follows, therefore, that this method is of limited application, and it is in practice confined to the observation of colloidal particles. The ordinary

dark-ground illuminator is a particular form of this apparatus limited in its scope to the observation of objects within the resolving power of the objective used. The organism of foot-and-mouth disease could not, therefore, be identified by this method from inanimate particles of the same order of size. Indeed, there is no suggestion in the original papers by Frosch that the ultra-microscope has been used in the researches which have led to the discovery of the virus of foot-and-mouth disease.

I am, Sir, yours faithfully,

August 9th, 1924. J. E. BARNARD.

INTOLERANCE TO A DENTURE.

To the Editor of THE LANCET.

SIR,—In reply to Dr. H. St. A. Agate it is quite possible to have a narrow upper denture attached by springs to the lower. By this means the upper is maintained in position with nothing to irritate the palate.

I am, Sir, yours faithfully,

W. RUSHTON.

Harley-street, W., August 9th, 1924.

SELECTIVE COLLAPSE IN ARTIFICIAL PNEUMOTHORAX.

To the Editor of THE LANCET.

SIR,—In April, 1922, Nathan Barlow and David Kramer published in the *American Review of Tuberculosis* a preliminary report upon selective collapse under partial pneumothorax. They discussed what appeared to them to be some of the shortcomings and disadvantages of artificial pneumothorax treatment as it is practised to-day; and they also pointed out that if small quantities of air are introduced into a free pleural cavity containing a lung only partially infiltrated with tuberculosis, the air so introduced will tend to collect over or round the diseased areas only, collapsing these and leaving the rest of the lung expanded and capable of function.

The advantages to be gained, if this selective collapse is possible, are obvious. Barlow and Kramer set them out as follows: (1) Little or no general disturbance on induction; (2) little or no general disturbance during treatment; (3) less disturbance of function if the pneumothorax was to be discontinued for any reason; (4) great widening of the choice of cases suitable for artificial pneumothorax treatment; (5) the possibility of inducing bilateral artificial pneumothorax safely and without distress to the patient.

The method seems to point a way to the solution of one of the great difficulties in the treatment of pulmonary as distinct from other forms of tuberculosis—that is, of resting the diseased organ or its diseased part. As our knowledge stands at present there are still only a small proportion of cases suitable for collapse, but this method should tend to enlarge that proportion considerably. For this reason it would have been expected that the publication of this work would have aroused a great deal of interest among those who practise pneumothorax treatment, and it is because this does not appear to be the case that I am emboldened to publish the fact, that by following out the technique laid down in the original article I have, during the last two years, been able to confirm Barlow's and Kramer's results in general. Further, that small quantities of air carefully introduced into a relatively free pleural cavity will produce selective collapse of the diseased areas only, and that in suitable cases all the advantages claimed actually occur.

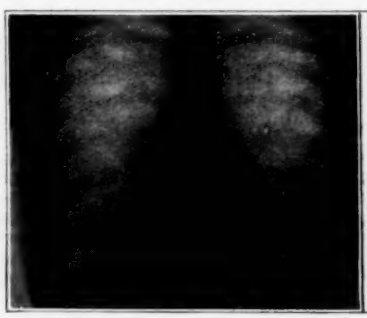
FIG. 1.

Case 1.—Before induction, showing infiltration of right upper lobe.

FIG. 2.

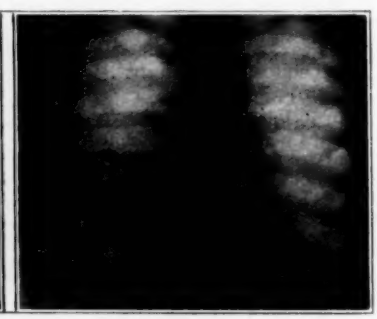
After induction, showing collapse of right upper lobe only.

FIG. 3.



Case 2.—Before induction, showing infiltration of lower part of right lower lobe.

FIG. 4.



After induction, showing collapse of right lower lobe only.

The method has not in my hands given 100 per cent. successes, but the results have been so very striking and encouraging that I have felt it worth while to spend a great deal of time in studying and practising it. I hope that this short account, with the accompanying illustrations, will be found sufficiently interesting to persuade my colleagues to give selective collapse a thorough investigation, so that its apparently great possibilities may be developed. As I have not modified or attempted to improve upon the original technique in any important details, I do not recapitulate it here, but refer those interested to the original article.

The plates show two typical cases before and after induction. In both the air was introduced in the same place—that is, between the fourth and fifth ribs in the mid-axillary line.

I am, Sir, yours faithfully,

R. C. WINGFIELD, M.B., B.Ch. Oxf.,
Medical Superintendent, Brompton Hospital Sanatorium, Frimley.

August 8th, 1924.

THE STROMA OF RED CORPUSCLES.

To the Editor of THE LANCET.

SIR,—For some years I have been treating cases of acute and chronic bacterial infections by a method based on the idea that the stroma of red corpuscles, when set free into the circulation by the destruction of the cell envelope, has toxic characters, and that this cellular endotoxin is a factor in disease. Briefly stated, the hypothesis is that in bacterial infections two factors have to be considered: firstly, the specific toxin which causes the manifestations of disease characteristic of the particular bacteria concerned, and secondly, a toxic substance set free from the red corpuscles by the hæmolytic properties possessed by most, if not all, pathogenic bacteria. In malaria I believe we have a disease in which the symptoms are due chiefly or entirely to this endotoxin, set free by the disruptive effect of the parasite on the red corpuscles. The aim of the method of treatment I have employed is to immunise the body against this endotoxin by using an emulsion of destroyed red cells as an antigen, exactly as a vaccine is used to set up immunity against a bacterial toxin.

The present state of the experimental evidence is as follows: (1) The subcutaneous injection of 1 c.cm. of a suspension of red cells destroyed by heat (56° C.) is followed by a local inflammatory reaction. No reaction follows the injection of unheated red cells. (2) C. J. Bond (*British Medical Journal*, Jan. 11th, 1919) has shown that red cells destroyed by grinding in a mortar are toxic to leucocytes, as shown by arrest of emigration of leucocytes and absence of iodophil reaction. (3) Washed red cells exposed to the rays of the tropical sun are rapidly destroyed and reduced to a granular débris, the glass container being kept immersed in water to eliminate the heat factor. These experiments were carried out in India in June, 1918; I have not been able to show any destructive effect on repeating the experiment in England. (4) Complement deviation tests to demonstrate the presence of an immune body in the serum after injection of destroyed red cells and in certain diseases have been carried out for me by Dr. W. W. Mackarell, pathologist to the Leicester Royal Infirmary; the results so far obtained, though suggestive, are not convincing. An acetone extract of washed red cells has been used as an antigen. Briefly, it may be stated that the serum of patients who had received a course of injections absorbed slightly more complement than serum from the same patients before the injections were begun. The serum of a patient suffering from malaria (benign tertian, before treatment with quinine) showed constantly a greater absorption of complement than any other serum tested.

I am anxious to obtain more experimental evidence in support of the toxicity of the stroma of red corpuscles at the hands of those who have more facilities than I have for animal experiment.

I am, Sir, yours faithfully,

Leicester, August 11th, 1924. T. C. CLARE.

TREATMENT OF ACUTE ANTERIOR POLIOMYELITIS.

To the Editor of THE LANCET.

SIR,—I read with much interest in your issue of July 26th Dr. Geoffrey Bourne's article on modern technique in the treatment of acute anterior poliomyelitis. My criticism of Dr. Bourne's treatment of this disease centres round the prominent place which he gives to massage as a curative agent, and the absence of prominence which he gives to active movements. Dr. Bourne, in my opinion, goes beyond any previous enthusiast for massage when he states that the mother is the most valuable ally in the campaign waged for recovery, and that massage is the weapon (to keep to the military metaphor) on which full reliance should be placed. The surprising statement is made that after two months the mother shoulders the whole burden, and full detailed instructions are given as to how this home massage should be carried out.

The treatment of infantile paralysis resolves itself essentially into recovery of normal motion. Any treatment of this disease must stand or fall by this test, and success can only be judged by the amount of movement obtained. Massage, in my opinion, is useless as a remedial agent for the recovery of muscle function; that is to say, it can neither initiate muscular movement nor can it increase its range or power. Massage has its function as a vasomotor stimulant, but beyond that I deny its efficiency in this disease. Dr. J. B. Mennell has stated (THE LANCET, 1924, i., 161) that "not infrequently, more harm than good is done by this treatment [i.e., massage] in cases of infantile paralysis," and again "massage assists the circulation . . . . but cannot possibly secure one single voluntary contraction."

Voluntary movement can only be initiated by the central nervous system, and gradually developed by systematic and carefully graduated exercises. Dr. Bourne gives six lines of treatment to movements both active and passive, and would seem apparently to place very little dependence on them. In an article on "modern treatment" no mention is made of what is essentially a modern development—muscle re-education. This I consider to be modern treatment—all else is purely subsidiary treatment. In any question of the recovery of muscle function in a case of infantile paralysis it is essential to differentiate between the upper and lower limbs. An amount of movement may be obtained in the upper limbs quite sufficient to subserve good function, but the same range and amount of movement may be quite inadequate in the lower limbs, where, apart from motion, the question of weight bearing has to be considered.

In my opinion, much subsequent weakness and deformity would be prevented if strict instructions were given that no child with infantile paralysis of one or both lower limbs should be allowed to stand or walk until the expiry of 12 months at least from the onset of the disease.

I am, Sir, yours faithfully,

CHARLES MACKAY, M.D.

Wimpole-street, W., August 11th, 1924.

A BIBLIOGRAPHY OF SIR THOMAS BROWNE.

To the Editor of THE LANCET.

SIR,—The notice of Mr. Geoffrey Keynes's excellent bibliography of Sir Thomas Browne, which appeared in THE LANCET of August 9th, prompts me to ask whether a curious parallel between Browne and a writer of a very different calibre—namely, Charles Dickens—has been noticed. Both men are best known by their first book, written in their early years: in the case of Browne when he was 29, in the case of Dickens when he was 23. Again, the original MS. of Religio Medici is lost and so is the original MS. of Pickwick. Only MS. transcripts exist of the former work, of the latter a few leaves exist. Both works have been translated into various foreign languages; and the last and most striking similarity is that both works gave rise to a generous crop of imitations. The list of imitations of Religio Medici is given from No. 387 to 470*b* in Mr. Keynes's bibliography, while as for Pickwick it will suffice to mention "Pickwick Abroad," "Pickwick in India," and "The Queerfish Chronicles," among many others. Between no two books so dissimilar in date, matter, and style can, I think, the same similarities be traced.

I am, Sir, yours faithfully,

Forest Row, August 12th, 1924. H. P. CHOLMELEY.

THE LATE DR. H. L. HANNA.—At the inquest on Dr. Henry Lyle Hanna, who was killed as the result of an accident while driving a motor-car near Linzford, Newcastle, Mr. A. E. Boulton, deputy coroner, expressed his opinion that the cause of death was an accident pure and simple. At a dangerous turning of the road two tyres burst, and as Dr. Hanna swerved to avoid a ravine, the car overturned. By his action, the coroner stated, Dr. Hanna had saved the lives of the other occupants of the car. The deceased, who qualified M.B., Ch.B. Dublin in 1923, held an appointment at the Fleming Memorial Hospital for Children, Newcastle.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

The Summer Recess.

THE House of Commons adjourned on Thursday, August 7th, for the summer recess until Oct. 28th. A resolution was passed empowering the Speaker, after consultation with the Government, to cause the House to meet at any earlier time if thought necessary in the public interest. The House of Lords adjourned until Sept. 30th. The Royal Assent was given by Commission to a number of Acts, including the National Insurance Act and the Workmen's Compensation (Silicosis) Act.

HOUSE OF COMMONS.

WEDNESDAY, AUGUST 6TH.

Local Authorities and Birth Control.

Mr. THURTLE asked the Minister of Health if new legislation was necessary before local authorities could be authorised to give information concerning birth control at maternity centres.—Mr. WHEATLEY replied: The question whether further legislation would be required is not free from doubt, but in any case, as I have already informed the hon. Member, I am not prepared to sanction the use of maternity centres for so controversial a purpose without express direction by Parliament.

Pensions Medical Officers and Overseas Service.

Lieut.-Colonel FREMANTLE asked the Minister of Pensions whether he was satisfied that, in selecting medical officers for discharge from his department, those who had not served overseas were discharged before those who, if equally efficient, had served overseas; and whether he was satisfied that no medical officer without overseas service was retained in a position for which an officer with overseas service was eligible and equally suitable.—Mr. F. O. ROBERTS replied: The answer to both parts of the question is in the affirmative, subject always to the paramount consideration of efficiency of the public service.

An Industrial Medical Service.

Captain REGINALD TERRELL asked the Secretary of State for the Home Department if it was the intention of the Government to establish an industrial medical service; and, if so, with what object.—Mr. HENDERSON replied: Provision is made in the Factories Bill for the amendment and extension of the existing system of medical examination of young persons for factory employment on the lines recommended in the report of the recent Departmental Committee (Cmd. 2135).

THURSDAY, AUGUST 7TH.

Male Inspectors of Physical Education.

Colonel Sir CHARLES YATE asked the President of the Board of Education how many male inspectors of physical education were now employed, and how many hours a week were devoted to the physical education of boys in elementary and secondary schools, respectively.—Mr. CHARLES TREVELYAN replied: There are at present one male staff inspector and two other male inspectors of physical training employed by the Board. Neither the code nor the regulations for secondary schools prescribe the number of hours in each week that thould be devoted to physical exercises. In public elementary schools the time varies, as a rule, from one to one and a half or two hours. In secondary schools one or two periods a week are generally given to physical exercises, in addition to any time given to organised games.

Health of the Unemployed.

Mr. WILLIAM THORNE asked the Minister of Health whether he had any information regarding the health of the unemployed men and women who had been out of employment for a lengthy period; and whether the percentage of illness of such men and women was higher than those persons regularly employed.—Mr. WHEATLEY replied: The expenditure by approved societies on sickness benefit under the National Health Insurance Acts affords some indication of the amount of sickness of all kinds amongst the insured population of the country, but the material in their possession does not make it possible to state whether the percentage of sickness is higher in the case of persons who have been out of employment for a lengthy period than in the case of persons regularly employed. Taking the insured population as a whole, there is no evidence that the prevalence of unemployment has adversely affected the claims for benefit under the Acts.

Medical News.

UNIVERSITY OF LONDON.—At a meeting of the Senate, held on July 23rd, the following teachers were recognised as teachers of the University, in the undermentioned subjects: Mr. Frank B. Bull, orthodontics (Guy's Hospital); Mr. Frederick N. Doubleday, dental materia medica (Guy's Hospital); Mr. William K. Fry, dental prosthetics (Guy's Hospital); Mr. Frank J. Pearce, operative dental surgery (Guy's Hospital); and Dr. Ida S. MacLean, biochemistry (Lister Institute of Preventive Medicine).

St. Mary's Hospital Medical School.—The University scholarships at St. Mary's Hospital Medical School have been awarded to T. C. Hunt, Magdalen College, Oxford, and D. N. Rocyn-Jones, Downing College, Cambridge.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—As the result of the Final Examination in Medicine, Surgery, and Midwifery, held during the month of July, the following candidates were approved in the subjects indicated, but are not eligible for diplomas:—

Medicine.—F. N. Adams, St. Bart.'s; C. Adamson, Cambridge and Durham; B. Adlington, King's Coll.; A. J. Amor, Middlesex; T. F. Anderson, Univ. Coll.; Doris M. Baker, St. Mary's; H. C. J. Ball and W. A. Barnes, St. Bart.'s; R. M. Barron, St. Thomas's; R. H. Bestawros, Cairo; Anna M. V. Bonhote, King's Coll.; W. A. Bourne, H. F. Brewer, and D. A. Brigg, St. Bart.'s; G. C. W. Brown, Cambridge and St. Bart.'s; E. Buchler, St. Bart.'s; P. Chandler, London; W. T. R. Chapman and F. W. Charman, King's Coll.; K. R. Chaudhri and Gwendoline Chave, St. Mary's; Florence C. Churcher, Univ. Coll.; S. Cleman, Guy's; A. H. F. Cole, Durham; Doris M. Collins, Royal Free; W. R. F. Collis and J. W. E. Cory, King's Coll.; A. C. Counsell, Middlesex; A. A. Dalby, Guy's; A. F. C. Davey, Manchester; A. L. Davies, Oxford and St. Thomas's; D. J. Davies, Middlesex; Kathleen Davies, Charing Cross; C. S. Drawmer, St. Bart.'s; W. A. D. Drummond, Dundee; G. D. Drury, St. Bart.'s; J. D. Durance, St. Mary's; S. F. Durrans, Guy's; J. T. R. Edwards, St. Bart.'s; N. B. Farman, Charing Cross; C. F. Fernando, Univ. Coll.; Elsie C. I. Focke, Royal Free; Dorothea C. Forbes, Royal Free and St. Mary's; D. R. Grant and R. A. Grant, Guy's; J. F. Hamber and Hans-Raj, King's Coll.; C. L. Harding, St. Bart.'s; Iris M. Harmer, Univ. Coll.; S. J. Hoffman, Middlesex; D. B. Hughes, London; D. S. Huskisson, Guy's; H. N. James and Beatrice Jervis-White-Jervis, St. Mary's; Dilys Jones, Westminster; J. D. Jones, Liverpool; C. J. Jowett, Manchester; Caroline B. Kibble, Royal Free; G. F. Kinder, Liverpool; A. J. King, London; Nancy T. Lancaster, Univ. Coll.; H. Levy, St. Bart.'s; E. I. Liberman, Guy's; W. E. Lishman, Liverpool; W. E. Lock, Middlesex; Madeline R. Lockwood, Univ. Coll.; Catherine B. McArthur, Royal Free; S. McClements, King's Coll.; F. G. Macdonald, St. Thomas's; Dorothy F. McIntosh, Charing Cross; H. Maclachlan, Guy's; J. H. Macpherson, King's Coll.; P. H. Martin, St. Bart.'s; Frances C. Nicklin, London; G. C. B. Oliver, St. Mary's; Evelyn D. Owen, Charing Cross; M. Y. Paget, Univ. Coll.; A. E. G. Parry, Birmingham; F. L. Patterson, London; C. E. Pearsons, St. Bart.'s; G. M. Pennant, King's Coll.; Audrey Phipps, Birmingham; Annie Pichaimuthu, Madras; H. C. Pierce, Cambridge and Liverpool; C. P. Pinckney, St. George's; B. Press, St. Bart.'s; J. Rafalowsky, Univ. Coll.; Olwen M. Richards, Charing Cross; G. D. Robb, Otago; J. T. C. Roberts, Liverpool; W. G. Roberts and W. F. Roper, Guy's; W. Richards, St. George's; Martha N. Russell, Royal Free; C. Sabhapati, Madras; C. M. Scott, Charing Cross; T. A. Seekings, Univ. Coll.; H. R. Shone, Liverpool; J. Shutt, London; Amelia M. Simmons, Charing Cross; Ethel L. A. Stamberg, Royal Free; R. Stanford, London; H. H. Steadman, Guy's; R. C. Tatham, Middlesex; J. D. S. Thomas, Guy's; R. W. Thomas, London; W. S. Thomas, Univ. Coll.; W. R. Thrower, St. Bart.'s; V. C. Tughan, K. H. Uttley, and J. H. M. Walker, Univ. Coll.; J. Wallman, London; R. A. Walsh, St. Bart.'s; H. V. Wells, Charing Cross; H. S. Welton, Liverpool; E. R. Williams, Cardiff; F. A. Wilson, Guy's; and Elizabeth E. Wintringham, St. Mary's.

Surgery.—C. H. Ackroyd, Leeds; G. L. Alexander, St. Bart.'s; G. T. Allerton, London; C. A. Amesur, St. Thomas's; S. M. Anderson, Middlesex; E. A. Aslett, St. Mary's; Alison E. M. Barnaby, Royal Free; S. A. Beards, London; L. F. Beccle, P. C. Bennison, and S. Berman, Guy's; R. V. Berrington, Liverpool; E. H. J. Berry, Guy's; O. P. Bewers, St. George's; H. E. Blake, Guy's; J. K. Bostock, Birmingham; P. G. Brain, London; S. Brest, St. Bart.'s; J. H. Broadhead, Guy's; T. H. P. Brooks, London; N. F. C. Burgess, Cambridge and Guy's; T. E. Cawthorne, King's Coll.; E. E. Claxton, St. Bart.'s; A. H. F. Cole, Durham; C. P. Craggs and B. W. Cross, St. Bart.'s; B. Crosthwaite, Durham; G. P. Crowden, Univ. Coll.; J. Cumming, Manchester; R. N. Curnow, St. Bart.'s; W. I. Daggett, King's Coll.; S. H. Daneel, Guy's; Gweneth M. Daniel, Westminster; D. J. Davies, Middlesex; E. W. P. Davies, Westminster; L. Davies, Guy's; G. H. Day, St. Bart.'s; F. M. Deighton, Univ. Coll.; G. W. S. de Jersey, Cambridge and St. Thomas's; D. S. Dixon, Middlesex; W. A. D. Drummond, St. Andrews; Josephine O. Ellen, Charing

Cross; Mary H. Elmitt, Royal Free; G. I. Evans, Manchester; J. P. Evans, St. Mary's; P. F. Evans, London; N. J. Everard, Sheffield; W. J. C. Fenton, London; M. G. Fitzgerald, St. Bart.'s; F. E. Fox, Cambridge and London; W. S. Fricker, King's Coll.; T. M. Fripp, Guy's; J. A. Galletly, Cambridge and Middlesex; J. Gaughan, Liverpool; N. T. Glynn, Cambridge and Liverpool; S. Goldstein, Westminster; G. D. Gordon, St. Thomas's; Minnie Gosden, London; F. G. Greenwood, St. Bart.'s; H. F. Griffiths, Cambridge and London; J. I. Griffiths, Univ. Coll.; R. F. Guymer, St. Thomas's; A. C. Hampson, Cambridge and Guy's; Constance E. Harrison, London; F. C. Hayward and W. E. Heath, St. Thomas's; O. L. Hutchinson, London; D. E. Iago-Jones and C. W. W. Jeremiah, Middlesex; L. Johnson, Liverpool; R. S. Johnson, St. Bart.'s; I. L. Johnstone, Middlesex; F. M. L. Jones, London; R. M. Jones, Guy's; W. E. Joseph, St. Thomas's; H. Joules, Middlesex; D. L. J. Kahawita, King's Coll.; L. A. Key, St. Thomas's; J. G. Kingsbury and F. H. K. Knight, Guy's; B. D. Knoblauch, Liverpool; R. L. Lancaster, London; G. S. Landon, Guy's; G. A. Q. Lennane, St. Thomas's; A. C. Liesching, St. Bart.'s; E. O. Lloyd, Middlesex; G. K. Loveday, St. Bart.'s; A. C. Lysaght, Guy's; W. J. McGuire, St. Mary's; G. R. Marcano and J. P. Marsden, St. Thomas's; F. Marsh, Guy's; F. Marty London; S. P. Meacock, Guy's; A. W. C. Mellor, St. Bart.'s; C. P. Miller, St. George's; J. G. Milner, St. Bart.'s; F. G. Mogg, Bristol; C. A. Mulligan, Manchester; J. V. O'Sullivan, London; W. B. Owen, Middlesex; T. B. Pahlajani, Charing Cross; V. Patrick, Manchester; J. E. Piercy, Guy's; F. D. S. Poole, St. Bart.'s; R. J. Prydderch, Liverpool; L. N. Pyrah, Leeds; V. I. Raman, London; M. D. Rawkins, St. Bart.'s; A. B. Robinson, St. Thomas's; G. L. F. Rowell, St. Bart.'s; A. T. F. Rowley, Bristol; S. D. Schultz, Middlesex; H. Smith, St. Bart.'s; E. F. Stead, London; A. W. Summersgill, Manchester; G. W. R. Thomson, St. Thomas's; W. R. Thrower and H. Treissman, St. Bart.'s; J. M. van Schalkwijk, Guy's; J. H. M. Walker, Univ. Coll.; L. B. Ward, St. Bart.'s; B. G. Wheatley, Middlesex; F. L. White, London; H. K. Williams, Guy's; J. H. Williams, London; J. Wood, King's Coll.; H. M. Worth, Guy's; and H. C. Wykerd, London.

Midwifery.—M. Abse, Univ. Coll.; C. Adamson, Cambridge and Durham; G. N. M. Aitkens, Charing Cross; T. F. Anderson, Univ. Coll.; N. A. Arnold, Guy's; E. L. Auguste, Middlesex; Grace L. Austin, Univ. Coll.; Doris M. Baker, St. Mary's; L. J. Barford, Guy's; C. M. Barker, Univ. Coll.; S. Bartlett, Liverpool; D. E. Barton, St. Mary's; S. A. Beards, London; L. F. Beccle and P. R. T. Becker, Guy's; H. S. Bell, Liverpool; S. Berman, Guy's; T. W. Best, Univ. Coll.; Jane G. Bevan, Westminster; O. P. Bewers, St. George's; F. T. Birkinshaw, Univ. Coll.; W. R. Bonner-Morgan, St. Bart.'s; Susanna M. Bornman, Royal Free; J. K. Bostock, Birmingham; Edith D. Bowie, King's Coll.; D. D. Boxill, St. Mary's; Elsie Boyton, King's Coll.; S. Brest and D. J. Brims, St. Bart.'s; A. H. Brockbank, Guy's; G. C. W. Brown, Cambridge and St. Bart.'s; J. L. Brown, King's Coll.; Margaret H. Brown, Charing Cross; W. A. Browne, St. Mary's; H. Bruce, Leeds; Olive B. Buckley, King's Coll.; N. F. C. Burgess, Cambridge and Guy's; Isabella M. G. Butler, Univ. Coll.; Avie R. H. Cama, Royal Free; Margaret E. M. Carter, St. Mary's; Fanny L. Cattle, Univ. Coll.; W. E. Chiesman, St. Thomas's; J. E. Church, St. Bart.'s; Florence C. Churcher, Univ. Coll.; T. A. Clarke, Liverpool; E. E. Claxton, St. Bart.'s; D. R. T. Clendon, Univ. Coll.; Hilda A. Cohen, Charing Cross; H. A. Cole, Liverpool; Marian B. Coleman, Royal Free; G. Coope, Manchester; Jean Cooper, Royal Free; J. W. E. Cory, King's Coll.; A. S. Cox, Bristol; Dorothy E. Crellin, Bristol; B. R. Crossley, Univ. Coll.; J. Crowther, Manchester; P. C. Cumber and R. W. Cunningham, Guy's; J. Currie, St. Bart.'s; Evelyn J. Curtis, King's Coll.; Gweneth M. Daniel, Westminster; R. S. Davidson, Manchester; Annie E. C. Davies, Westminster; A. L. Davies, Oxford and St. Thomas's; G. Davies, Guy's; H. J. Davies, St. Mary's; Kathleen Davies, Charing Cross; L. Davies, Guy's; W. H. Davies, Westminster; G. Dignam, Manchester; H. E. M. E. Douglas, Liverpool; C. S. Drawmer, St. Bart.'s; H. Duff, Liverpool; D. F. Durward, Guy's; W. G. P. Dyson, Manchester; H. C. Edmunds, King's Coll.; R. W. Edwards, Guy's; Daisy M. Ellis, Edinburgh; A. J. Enzer, St. Bart's; I. Evans, St. Thomas's; J. Evans, Charing Cross; N. J. Everard, Sheffield; Christabel S. Eyre and Helen E. Fergusson, Charing Cross; C. F. Fernando, Univ. Coll.; H. E. Filmer, Guy's; J. W. Fisher, St. Mary's; A. H. W. Fleming, Manchester; Dorothea C. Forbes, Royal Free and St. Mary's; G. R. Ford, Guy's; Gladys M. Foxcroft, Royal Free; C. A. Francis, St. Bart.'s; C. L. Froehlich, Guy's; S. W. Gabbe, St. Thomas's; G. A. Garrett and J. Gaughan, Liverpool; Winefride M. Gibson, Charing Cross; G. D. Gillbard, Middlesex; N. T. Glynn, Cambridge and Liverpool; A. Gompertz, Durham; J. G. Goodman, Guy's; H. W. Gordon, St. George's; Minnie Gosden, London; J. Gray, Guy's; F. G. Greenwood, St. Bart.'s; H. F. Griffiths, Cambridge and London; H. L. Groom, Univ. Coll.; R. F. Guymer, St. Thomas's; G. Hamada, Birmingham; Iris M. Harmer, Univ. Coll.; Constance E. Harrison, London; W. D. Hasler, Middlesex; Irene D. F. C. Hastilow, Birmingham; Marjorie F. M. Hayward, London; Lynette Hemmant, King's Coll.; L. F. Henry, Liverpool; Freda K. Herbert, King's Coll.; Catherine M. Hext, London; H. F. Hiscocks, St. Bart.'s; F. Hoffstein, Charing Cross; F. H. Hollingshead, Bristol; H. B. Howell, St. Bart.'s; J. U. Human, Guy's; O. R. Humphreys, Cardiff; D. S. Huskisson, Guy's; D. J. C. Hutton, Middlesex; Adele H. Jacob, Royal Free; M. E. M. Jago, Guy's; Isabel E. S. James, King's Coll.; T. L. Jenkins, Middlesex; Beatrice Jervis-White-Jervis, St. Mary's; L. Johnson, Liverpool; Dilys Jones, Westminster; G. L. C. Jones, St. Bart.'s; I. H. Jones, Charing Cross; J. Jones, Cardiff; J. D. Jones, Liverpool; J. Joseph, Middlesex; Doris E. Keeves, Birmingham; J. J. Keevil, St. Thomas's; T. M. Kellough, Guy's; R. P. S. Kelman, Otago; Frances M. Kenyon, King's Coll.; H. Kesselson, Charing Cross; L. A. Key, St. Thomas's; A. J. King, London; C. T. Kitching, St. Thomas's; B. D. Knoblauch, Liverpool; S. N. Lahiri, Dundee; Marjorie A. M. Lambert, Royal Free; Nancy T. Lancaster, Univ. Coll.; R. L. Lancaster, London; S. W. Lane and Nora Leesmith, St. Mary's; G. A. Q. Lennane, Cambridge and St. Thomas's; H. M. O. Lester, St. Thomas's; S. Levy, Middlesex; A. C. Liesching, St. Bart.'s; Leonora M. K. Lines, Charing Cross; F. Lishman, Durham; T. J. Lloyd, Cardiff; Edna Lock and S. McClements, King's Coll.; F. G. Macdonald, St. Thomas's; Dorothy F. McIntosh and Kathleen G. B. McMahon, Charing Cross; Helen M. J. McQuaid, St. Mary's; R. G. Maliphant, Univ. Coll.; Eva M. Malmberg, King's Coll.; G. R. Marcano, St. Thomas's; D. P. Marks, Cambridge and St. Thomas's; J. P. Marsden, St. Thomas's; C. H. Mason, St. Mary's; S. Mellins, Middlesex; R. F. Middleton, Birmingham; F. C. Miller, Guy's; F. G. Mogg, Bristol; E. R. W. Monsglaser, Basle and Middlesex; S. K. Montgomery, Univ. Coll.; A. L. Moorby, King's Coll.; H. Moore, Guy's; G. J. Morris, Middlesex; T. W. Morris, Liverpool; R. H. Mortis, Charing Cross; E. F. Morton, Middlesex; I. S. Moscow, St. Bart.'s; A. M. Murray, Middlesex; K. V. Nair, London; Y. Nawar and Muriel I. H. Naylor, Birmingham; C. E. Nicholas and Frances C. Nicklin, London; Jessie G. A. Norman, Charing Cross; J. V. O'Sullivan, London; D. R. Owen, Cardiff; W. B. Owen, Middlesex; S. G. Pandit, Bombay; Dorothy M. Payton, Birmingham; C. E. Pearsons, St. Bart.'s; C. O. Perera, Ceylon; G. F. D. Perrott, St. Bart.'s; H. C. Pierce, Cambridge and Liverpool; C. P. Pinckney, St. George's; T. J. Pittard and B. Press, St. Bart.'s; L. W. Proger, Middlesex; D. C. Prowse, Bristol; Muriel A. Pugh, Charing Cross; P. E. Pym, St. Bart.'s; L. N. Pyrah, Leeds; J. Rafalowsky, Univ. Coll.; J. R. Ratcliffe, Guy's; M. D. Rawkins, St. Bart.'s; Marjorie D. Reddan, Royal Free; D. I. Rees, St. Thomas's; G. D. Robb, Otago and Middlesex; W. F. Roper, Guy's; A. W. L. Row, G. L. F. Rowell, and T. W. E. Royden, St. Bart.'s; Martha N. Russell, Royal Free; C. Sabhapati, Madras; K. G. Salmon, St. Bart's; K. G. W. Saunders, St. Thomas's; M. Schwartzman, Odessa and Middlesex; W. G. Sears, Guy's; R. Sellick, St. Thomas's; J. W. Shackle, Guy's; C. E. Sharp, Univ. Coll.; Catherine E. M. Siddall, Royal Free and St. Mary's; T. St. J. H. Silvester, Guy's; F. C. Simpson, Manchester; Constance G. Sloan, St. Mary's; Frances E. Smith, Charing Cross; Sylvia M. T. Smith, Cardiff and Bristol; J. Stein, Univ. Coll.; J. A. F. Storrs, St. Bart.'s K. A. Soutar, St. Thomas's; L. P. Spero, St. Mary's; Elizabeth L. Taylor-Jones, Royal Free; D. E. Thomas, St. Bart.'s; J. G. T. Thomas, St. Mary's; R. W. Thomas, London; E. Thompson, St. Thomas's; H. Trafford, Guy's; H. Treissman, St. Bart.'s; E. A. Trim, St. Thomas's; K. A. Turner, Leeds; L. G. W. Urich, Middlesex; Dorothy I. Valentine, Liverpool; H. Van der Post and J. M. van Schalkwijk, Guy's; W. A. Vickers, Liverpool; J. Wallman, London; T. E. Walsh and A. G. Walter, St. Thomas's; R. L. Waterfield, Guy's; T. E. Watkins, Cardiff; W. N. Welinkar, Middlesex; Rosalind E. O. White, Charing Cross; I. E. Whitehill, Univ. Coll.; H. D. E. Whitman, Cardiff; R. A. K. Wiener, St. Thomas's; J. McM. Wilder, London; D. P. Williams and E. C. P. Williams, Middlesex; J. H. Williams, London; W. B. Williams, Charing Cross; D. A. Wilson, Middlesex; N. Wilson, Univ. Coll.; Ellen Wirtz, Royal Free; J. T. Woodhead, St. George's; C. L. Worthington, Guy's; and E. W. C. Woutersz, St. Mary's.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.—The Goldsmid Entrance Exhibitions for 1924 have been awarded to Mr. C. L. Owen, Trin. Coll., Cambridge; and Miss F. C. Kelly, Univ. Coll., London.

Bethlem Royal Hospital has been admitted as a school of the University of London in the faculty of medicine for the purpose of research in psychological medicine.

UNIVERSITY OF PARIS.—Post-graduate courses on dermatology and venereal diseases, commencing respectively on Oct. 3rd and Nov. 5th, 1924, will be held at the Clinique de Dermatologie et de Syphiligraphie of the Hôpital St. Louis, Paris, under the direction of Prof. Jeanselme. The fee for each course is Fr.150. A detailed programme and all further particulars may be obtained from Mr. Burnier, Chef du Clinique à la Faculté, Hôpital St. Louis (pavillon Bazin), 40, Rue Bichat, Paris (X^ième).

MIDDLESEX HOSPITAL MEDICAL SCHOOL, LONDON.—The introductory address at the opening of the winter session 1924–25, on Oct. 1st, will be delivered at 3 P.M. at the Queen's Hall by Dr. Charles Porter, on Some Aspects of Preventive Medicine, after which the prizes gained during the previous year will be distributed by the Earl of Birkenhead. In the evening, at 7.30, the annual dinner will be held at the Hotel Cecil, when Mr. G. Gordon-Taylor, M.S., F.R.C.S., will preside. Those wishing to be present at the dinner should communicate as soon as possible with the Secretary-Superintendent of the hospital.

ARTIFICIAL HELIOTHERAPY.—Recently the Hull Corporation authorised the maternity and child welfare committee to establish an experimental sunshine clinic for the administration of artificial heliotherapy to ailing and rickety children under 10 years of age.

Messrs. W. Heffer and Sons, Ltd., announce the early appearance of Practical Physical and Colloid Chemistry for Students of Biology and Medicine, by Prof. Leonor Michaelis, of Berlin, translated from the second German edition by T. R. Parsons, M.A., B.Sc., demonstrator in physiology in the University of Cambridge.

THE Kent County Council, at their quarterly meeting, held on August 6th, decided unanimously to increase the salary of their county medical officer, Dr. Alfred Greenwood, from £1400 to £1600, without any application having been made by that officer.

THE annual report for 1923 of the Chief Medical Officer of the Ministry of Health, shortly to be issued to the public, is 211 pages in length, including four short appendices, and may be obtained either direct from H.M. Stationery Office or through any bookseller, price 3s.

COTTON-SPINNERS' CANCER.—Following on the ruling of Judge Mossop in the test case before the Ashton under-Lyne County Court (see THE LANCET, August 2nd p. 239), where compensation was awarded to an operative mule-spinner who had contracted epithelioma of the scrotum in the course of his employment, an Oldham mill company has been served with a claim for compensation under the Workmen's Insurance Act. The case is that of a cotton-spinner who has been dead for two years, and who ceased his connexion with spinning eight years before his death.

THE LATE DR. R. A. WILLIAMS.—Dr. Robert Arthur Williams, who died recently at his residence at Porthcawl, was one of the oldest medical practitioners in South Wales and was well-known throughout Glamorgan. A native of Carnarvon, he was 74 years of age, and had been in general practice for nearly 43 years, 28 of which were spent at Ogmore Vale. He will be remembered by his many friends and patients, who had for him a great admiration as one of the rescue party in the Park Slip Colliery explosion, which occurred some 30 years ago and in which he nearly lost his life. Dr. Williams, who was one of the senior magistrates of the county, was a graduate of Edinburgh University, having qualified M.B., C.M. in 1882. He leaves a widow, one son, and two daughters.

DONATIONS AND BEQUESTS.—Under the will of the late Alderman G. Macpherson, of Wolverhampton, the testator left, among other bequests, £250 to the Royal Orthopædic and Spinal Hospital, Birmingham; £250 to the Royal Orphanage, Wolverhampton; £250 to the Wolverhampton and Midland Counties Eye Infirmary; and £250 to the Wolverhampton and Staffordshire General Hospital. Failing certain family trusts, he left £5000 to the Royal Orthopædic and Spinal Hospital, Birmingham; £5000 to the Royal Orphanage, Wolverhampton; £5000 to the Wolverhampton and Midland Counties Eye Infirmary; £5000 to the Wolverhampton and Staffordshire General Hospital; and the ultimate residue to the British Red Cross Society and/or such other societies, hospitals or institutions as may have been founded or established for the relief, cure, care, maintenance or support of wounded and disabled or blinded soldiers and sailors.—By the will of the late Mrs. Mary Frances Thorne, of Dunconusg, Lossiemouth, N.B., and of Heckfield, Hants, the testatrix left £1000 to the London Hospital, Whitechapel, for the maintenance of the "Maggie's Bed," and £1000 to the Royal Free Hospital, Gray's Inn-road, for the maintenance of the "Augustus Thorne" Bed.—The late Mrs. Louisa Walker, of Leytonstone, Essex, left by will £500 each to the London Hospital and the Poplar Hospital for Accidents.—By will the late Mrs. Camilla Anna Olympia Bertie-Roberts, of Chelsea left, among other bequests, £2000 equally between the Chelsea Hospital for Women, the Victoria Hospital for Children, the West End Hospital for Nervous Diseases, the Ophthalmic Hospital, the Normal School of Music for the Blind, and the Seamen's Hospital, Greenwich, and £100 to the Home for Disabled Soldiers and Sailors as well as £50 to the Home for the Dying, Mare-street, Hackney.—Among other bequests, the late Mr. G. M. Henton, of Leicester, left by will £1000 to the Leicester Infirmary.—The late Mrs. Emma Hinchliffe, of Upper Norwood, bequeathed by will £2000 to the Hospital for Sick Children, Great Ormond-street, in memory of her husband, Walter Hinchliffe; £1000 each to the Sunshine House Blind Babies' Home, Chorley Wood, the Westminster Hospital, the Cancer Hospital, Fulham-road, the Home for Incurables, Streatham, and the Home for Incurables, Putney; and (after personal bequests) all other her property "to the hospitals named above, especially those for children."

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, August 18th.—11 A.M., Surgical Registrar: Surgical Wards. 2 P.M., Mr. Simmonds: Surgical Out-patients. 2 P.M., Dr. Scott Pinchin: Medical Out-patients.

TUESDAY.—12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Vlasto: Throat, Nose, and Ear Dept.

WEDNESDAY.—11 A.M., Medical Registrar: Medical Wards. 2 P.M., Mr. Tyrrell Gray: Operations. 2.30 P.M., Mr. Donald Armour: Surgical Wards.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 12 noon, Dr. Scott Pinchin: Diseases of the Heart. 2 P.M., Mr. Bishop Harman: Eye Dept.

FRIDAY.—11 A.M., Mr. Simson: Gynæcological Demonstration. 2 P.M., Dr. Burrell: Medical Out-patients. 2 P.M., Mr. Sinclair: Surgical Out-patients.

SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks Davis: Throat, Nose, and Ear Operations.

Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, August 18th, to SATURDAY, August 23rd.—THE HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton. Mon., 10 A.M., Dr. Burrell: Demonstration of Cases illustrating Protein Tests and Treatment of Asthma. 12 noon, Dr. Beaumont: Demonstration of Cases. 2 P.M., Dr. Melville: Demonstration in X Ray Department. Tues., 10.30 A.M., Dr. Punch: Demonstration of Morbid Anatomy. 11.30 A.M., Dr. Davidson: Demonstration of Cases. Wed., 10.30 A.M., Mr. Tudor Edwards: Operations. 2 P.M., Dr. Gosse: Demonstration in Wards. Thurs., 10 A.M., Dr. Burrell: Artificial Pneumothorax and Thoracoscopy. 12 noon, Dr. Beaumont: Demonstration of Cases. Fri., 10 A.M., Dr. Davidson: Demonstration of Cases. 11 A.M., Dr. Nelson: Artificial Pneumothorax. 2 P.M., Mr. J. E. H. Roberts: Operations. Sat., 11 A.M., Dr. Batty Shaw: Demonstration of Cases.—QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, E. Mon., 10 A.M., Mr. Broster: Cases illustrating General Surgery. 2 P.M., Mr. Nesfield: Conjunctivitis, Corneal Ulcer, Corneal Opacity. 4.30 P.M., Mr. Kenneth Lees: Demonstration on Mastoid Operation. Tues., 11 A.M., Mr. Kenneth Lees: A Practical Demonstration on Tonsillectomy. 2 P.M., Dr. King: Medical Cases. Wed., 10 A.M., Mr. Todd: Cases illustrating Orthopædic Principles. 2 P.M., Mr. Nesfield: Squint and its Treatment; Some Points in Refraction in Children; The Blindness of One Eye in Children. Thurs., 10 A.M., Dr. Winnicott: Medical Cases. 2 P.M., Mr. Whitchurch Howell: Demonstration of Surgical Cases, chiefly Orthopædic. Fri., 10 A.M., Mr. Broster: Cases illustrating General Surgery. 3.30 P.M., Mr. N. C. Lake: Surgical Treatment of Hypertrophic Stenosis. Sat., 10 A.M., Mr. Whitchurch Howell: Operations.

Appointments.

ADAM, J., M.B., C.M. Glasg., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Handsworth District of the county of York.

DORWARD, W. F., M.B., Ch.B. St. And., Superintendent of the St. Luke's Hospital at Haifa under the Jerusalem and the East Mission.

MERCER, L. D., M.B., Ch.M. Sydney, F.R.C.S. Edin., Honorary Assistant Surgeon for Diseases of the Ear, Nose, and Throat, Salford Royal Hospital.

PLATT, H., M.D., M.S., F.R.C.S. Eng., Consulting Orthopædic Surgeon to the Lancashire Education Committee.

SMITH, N. Ross, F.R.C.S. Eng., Resident Medical Officer to the Freemasons Hospital and Nursing Home, Chelsea.

Vacancies.

For further information refer to the advertisement columns.

Bradford, Municipal General Hospital, St. Luke's.—H.P.'s and H.S.'s. Each £200.

Brighton, New Sussex Hospital.—H.S. £50.

Bristol General Hospital.—Two H.P.s, two H.S.'s, Res. Obstet. O., and Cas. H.S. Each £80.

Bristol Royal Infirmary.—Cas. H.S., Obstet. and Ophth. H.S. Each £100. H.P.'s and H.S.'s and Asst. Obstet. H.S. Each £80. Also Dental H.S. £116.

Bromley Borough.—Temp. Asst. M.O.H. £600.
Cairo School of Medicine.—Lecturer in Physics. L.E.540–840. Also Prof. of Physics, Prof. of Clin. Med., and Prof. of Clin. Surg. Each L.E.900–1140.
Carlisle, Cumberland Infirmary.—Res. M.O. £175.
City of London Hospital for Diseases of the Heart, Victoria Park, E.—Half-time M.O. £200.
Colchester, Essex County Hospital.—H.S. £200.
Dundee Royal Infirmary.—Hon. Asst. P. for Dis. of Children.
Durham County Council Education Dept.—Asst. Oculist. £600.
East Ham County Borough.—Asst. M.O. £600.
Freetown, Sierra Leone, Sir Alfred Jones Research Laboratory.—Research Asst.
Gloucestershire Royal Infirmary, Gloucester.—Asst. P. and Pathologist.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—H.P. £100.
Kent Education Committee.—School Dentist. £504 14*s.*
Manchester Ear Hospital, Grosvenor-square.—H.S.
Melbourne University, Victoria, Australia.—Chair of Pathology. £1200.
Montana, Valais, Switzerland.—English Sanatorium. Asst. P.
Otago University, New Zealand.—Prof. of Surgery. £600.
Portsmouth Royal Hospital.—Third H.S. £150.
Preston, Lancs., County Mental Hospital, Whittingham.—Locum Tenens M.O. £8 8*s.* weekly.
Prison Medical Service.—M.O.'s. £350.
Royal Naval Medical Service.—Surgeon Lieuts. 25*s.* per day.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. £100.
Southampton Free Eye Hospital.—Hon. Consulting S. and Hon. Dental S.
Staffordshire Education Committee.—Asst. Sch. Med. Insp. £600.
Sunderland Royal Infirmary and Children's Hospital.—Visiting M.O. £400.
Tunbridge Wells General Hospital.—H.S. £160.

The Chief Inspector of Factories announces the following vacant appointment: Market Deeping, Lincoln.

The Secretary of State for the Home Department gives notice of vacancies for Medical Referees under the Workmen's Compensation Act, 1906, for the Districts of the Dewsbury, Leeds, and Wakefield County Courts. Applications should reach the Private Secretary, Home Office, not later than August 30th.

Births, Marriages, and Deaths.

BIRTHS.

HALCOMB.—On August 4th, at Doncaster, the wife of Dr. C. D. Halcomb, of a son.
HUME.—On August 7th, at Ellison-place, Newcastle-on-Tyne, the wife of Dr. W. E. Hume, of a daughter.
PHILIP.—On July 29th, at Greenleaf-road, Walthamstow, the wife of George S. Philip, M.B., B.S., of a daughter.
WYATT.—On August 7th, at a nursing home in Birmingham, the wife of R. B. Hervey Wyatt, M.A., M.B., of a son.

MARRIAGES.

LYLE—KIME.—On July 26th, at Christ Church, Mayfair, Herbert Willoughby Lyle, M.D., F.R.C.S., F.K.C. Lond., to Grace, daughter of Mrs. Kime, of Fulbeck, Lincoln.

DEATHS.

COLLINS.—On August 6th, at Broseley, Shropshire, George Duppa Collins, M.R.C.S., L.S.A.
COTTELL.—On August 7th, at a nursing home in London, Colonel Reginald James Cope Cottell, C.B.E., and Knight of Grace of the Order of St. John of Jerusalem, of Phillimore-terrace, Kensington.
ROSSER.—On August 11th, at Glenalmond, Horley, Walter Rosser, M.D., late of Croydon, in his seventy-ninth year. Funeral at Parish Church, Reigate, Friday, at 3.30. No flowers.
WILLIAMS.—On August 7th, at Glenholm, West Walk, Leicester, Montagu W. Williams, M.R.C.S., L.R.C.P. Lond., L.S.A., aged 65 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE LANCET: SUBSCRIPTION RATES.

INLAND	One Year	£2	2	0
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	Three Months	0	10	6
ABROAD	One Year	2	10	0
	Six Months	1	5	0
	Three Months	0	12	6

SMALL ADVERTISEMENT RATES.

Books and Publications .. .. .. } Four Lines
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Trade and Miscellaneous Advertisements }
Every additional line 1*s.* 6*d.*

For complete scale of advertisement charges apply to the Manager.

Notes, Comments, and Abstracts.

HEALTH SHRINES.

THE idea that cures are inherent in certain localities is of hoar antiquity, and the pilgrimage which, we are informed, will start for Lourdes from Wimbledon next month is in a tradition dating from the beginning of the oldest civilisations known to us. The pilgrims will start encouraged by the belief that in 1922 two cases of Pott's disease and one of advanced tuberculosis were suddenly and radically cured at Lourdes. Such cures were necessarily "miraculous," for mere science or mere nature, though they may remove mountains on occasion, cannot suddenly arrest caries of the spine or restore the mischief done. A learned paper on the Cult of Asklepios and its rôle in the History of Medicine was read before the Third International Congress of the History of Medicine, by Dr. Alexander Cawadias, O.B.E., formerly chef de clinique of the Beaujon Hospital, Paris, and now senior physician and lecturer in clinical medicine at the Evangelismos Hospital, Athens. The paper has now been separately published as a pamphlet, in which Dr. A. Cawadias cites inscriptions discovered by his father, Dr. P. Cawadias, in the medical sanctuary at Epidaurus in 1881. "Some examples," writes Dr. Cawadias, "taken from the inscriptions discovered by my father in which are laid down the cures of Asklepios, will convince us that these cures were simple miracles such as are to-day the miracles of the Madonna of Lourdes or those of the Holy Virgin of Tenos in the Ægean." The inhabitants of the Ægean shores, when civilisation centred on those coasts, knew nothing of Pott's disease as a syndrome, but they believed that visits to particular shrines such as Epidaurus cured this and a number of other complicated conditions. "A woman is pregnant for five years," says the pamphlet, quoting the inscriptions. "After sleeping in the temple she awakes and is obliged to run rapidly out of the sanctuary because she felt that her pregnancy was coming to an end. She gave birth to a child which immediately after birth began to wash himself unaided, to walk and follow his mother." Again, a man with four fingers paralysed did not believe in the cures of Asklepios, but he consented to sleep in the Abaton, a building near the temple of Epidaurus specially dedicated to cures. While here he dreamt that he saw himself playing dice, and that the god rushed in and extended his fingers. A man, apparently blind of one eye, dreamt that he saw the god dropping something into the orbit. Both he and the man with a numbness of the fingers were thus miraculously cured. The dream and the vision of the god form part of the ritual of the cure in ancient times, just as among modern believers the cure has been preceded by an apparition either of a saint or a higher power. Among the Hindoos of the time of Père Dubois, for instance, a good-looking young priest invariably appeared in a dream in certain temples frequented by barren wives anxious to conceive and bear children. It would be unfair, however, to suggest that Lourdes and such shrines alone represent the survival of primitive faiths. The Continent, despite its rationalism, positively exudes belief in folk-medicine. No need for the French peasant—certainly in the Eastern provinces—to go to Lourdes to be cured of rheumatism in a vision. He can buy a cat-skin from among the pile in many a chemist's shop, and this will cure him if laid on the afflicted place, for it is still supposed to contain electricity. And, at any rate, as a grave person recently informed us, it keeps you warm. The established price of such a skin is 15 francs.

NEW MEDICAL EQUIPMENT IN THE UNITED STATES ARMY.

THE Medical Corps of the U.S. Army has a Medical Field Service School, in association with which is the Medical Department Equipment Laboratory at Washington. Here was planned the U.S. first-aid packet (THE LANCET, 1922, i., 960), and recently Major J. P. Fletcher, the Director, tells [1] us it has devised a battalion dispensary equipment to supply the needs of a battalion medical officer, particularly with regard to the requirements of the main dressing station. Experience having shown that 20 per cent. is the proportion of casualties to be expected, these have been averaged, and supply of dressings, &c., has been calculated thereon. The foundation of the equipment is four cases, measuring 31 in. by 19 in. by 15 in., marked M.D. 1, 2, or 3 (M.D. 1 is in duplicate). The cases have steel corners and are built up, not of three-ply wood merely, but of three-ply wood backed with steel, ¼ in. in all, a material which is thick, light, and strong, and easily got because used for trunk making in the United States. Each weighs

[1] The Military Surgeon, June, 1924, p. 715.

39 lb. The two M.D. 1 cases carry dressings; they stand on their ends and open like a wardrobe. In the lid is a flap-table which rises when the lid is opened to a right angle, and articulates with the rest of the chest to form a table for instruments, &c., and there is a fitting to hold the handles of a stretcher on the side of the chest. The chests M.D. 2 and 3 are mere shells, their contents being carried in trays, so planned that they can be taken out and built up into something like a dinner wagon, when all their stores are available without further unpacking. The whole equipment has been very carefully thought out. M.D. 2 is "the drug trunk," and M.D. 3 "the kitchen trunk," with a flashlight, a gasoline stove, a six-quart kettle, tea, coffee, and milk to provide the wounded with hot drinks; even cigarettes are not forgotten. In addition, there is a "lantern crate," with paraffin, three hurricane lamps, and three spare glasses. Also there is a small tent with pole sections to shelter one or two stretcher cases under operation. A bag of splints, a bag for sterilising water, 12 stretchers, 36 blankets, shovel, pick, &c., complete this large supply. We would point out, however, that Major Fletcher's paper must be read in the original, for without the illustrations it is impossible to appreciate the ingenuity of the apparatus. Further, we commend a system which allows the officer chiefly responsible for a novel equipment, as this is, to explain it to the Service before issue, thus winning for it in advance interest and perhaps approval, and side-tracking ill-informed criticism.

FACTORY GIRLS' COUNTRY HOLIDAY FUND.

To the Editor of THE LANCET.

SIR,—Will you allow us to make a very urgent appeal for funds to send working girls and women away for a short holiday? Many of those who are hoping to go during the next few weeks have never slept out of London for a single night. They have been saving up for months to get this unique privilege, and are even now counting the days in hot workshops and dusty factories, till they can have if only one week of freedom and fresh air. The large amount of unemployment which still continues among men has made the women and girls in many cases the sole support of their families. It is obvious that these cannot pay much towards their holidays; obvious, too, that young people living in narrow streets and overcrowded rooms may be permanently injured in health if no change is possible.

In weather such as this, who can happily arrange or take a holiday without doing something to enable those less fortunate to have—for even one week—the good food and rest and refreshment that may set them up for the long months of the winter's work?

Subscriptions and donations will be thankfully received by the Chairman of the Executive Committee, Mr. J. F. Green, or Miss Canney, 75, Lamb's Conduit-street, W.C. 1.

Yours faithfully,

(Signed) ALBERTA SANDWICH, MARY ST. HELIER, J.P., L.C.C.
A. F. LONDON, J. A. HERTZ, Chief Rabbi.
MARY SCHARLIEB, ROBERT F. HORTON,
LOUISE CREIGHTON, FRANK LLOYD.

August 11th, 1924.

MEDICAL ATTENDANCE IN STREET ACCIDENTS.

THE Bolton watch committee has received a letter from the branch secretary of the British Medical Association, Lancashire and Cheshire Branch, stating that the branch had been requested by the Chief Constable of Lancashire to lay down a scale of fees for attendance on cases of accidents or sudden illness in the street when a medical man is summoned, and that the following fees were accepted by the Chief Constable of Lancashire as being suitable—viz., between 8 A.M. and 8 P.M., 7*s.* 6*d.* per visit; between 9 P.M. and 8 A.M., 15*s.* per visit, with mileage of 1*s.* per mile beyond one mile from the residence or surgery of the doctor called on by the police to give medical and surgical aid; and asking this committee to adopt a similar scale of fees. The Chief Constable recommended that the scale should be adopted and the committee agreed.

AN AID IN DEFÆCATION.

THE ordinary closet seat does not permit the squatting position to be used in the act of defæcation, though there are many sound reasons why this position, which is naturally assumed by primitive peoples and children, is to be commended. For the last 20 years improved closet seats have been exhibited at medical gatherings, see, for instance, THE LANCET, 1905, ii., 167. We have now received from the Proper Adjustable Foot Rest Company, 36, Northgate, Newark-on-Trent, Notts, a description of an adjustable foot-rest the use of which ensures the correct squatting position on the w.c. seat. It can be used with any w.c. pan, is adjustable for tall or short people, and is readily affixed to wood, tile, or concrete flooring. The price is 45*s.*

GRATUITOUS MEDICAL ATTENDANCE.

To the Editor of THE LANCET.

SIR,—Among the unwritten laws of medical ethics there appears to be fluctuations, yet, I suppose, there are certain fixed or semi-fixed ideas which are held more or less in common.

I am writing to ascertain the general view of the medical profession with regard to non-medical persons from whom fees should not be accepted. Naturally "hawks dinna pyke oot hawks e'en," and the doctor goes scot-free. His wife also is exempt. On these points I have no doubt all are in agreement. What I should like to know is how far the list extends. I venture to schedule the following:—Doctors' widows; doctors' children, while dependent; nurses and medical students.

In old days I believe clergymen were placed on the free list, and qualified dentists also. Probably this is still general. Would one now include those whose activities are placed at the profession's disposal—e.g., chemists?

I think the point may not be without interest because practice in these matters does not appear to be uniform.

I am, Sir, yours faithfully,

August 9th, 1924. INQUIRER.

*** As the medical profession has become more subdivided, and as the groups directly ancillary to medicine have become more numerous, applicability of general rules has been found in practice impossible. No doctor charges a doctor, but even here there may be exceptions by mutual agreement, the reasons for which will occur to everyone. Again, if the widow of a doctor can pay easily for medical attendance, she does not, as a rule, demand gratuitous services from medical men who are strangers; while no practitioner, previously in relations with her husband, allows her to pay except as the result of conversation on the subject. With regard to medical students, their care naturally devolves without payment of fees on those who have charge of their studies, though it is easy to see that here particular circumstances might dictate quite naturally the offer and the acceptance of fees. Nurses always obtain medical advice and treatment from those with whom they work professionally. But the qualified dentist is in rather a different case and is usually dealt with in accordance with particular circumstances; no general law can possibly meet those circumstances, but mutual arrangements that are fair and that preserve professional cordiality can usually be arrived at. The custom of attendance upon the clergy has for many years followed the individual inclination of practitioners, but the sympathy of the medical profession for their ill-paid clerical colleagues has always been practically manifested, and is so to-day.—ED. L.

URGENT TELEPHONE CALLS.

To the Editor of THE LANCET.

SIR,—In THE LANCET of August 9th you quote from Dr. Waldo's remarks concerning the ignorance of the public about all matters connected with fires, especially his observation that: "Not uncommonly, again, on the breaking out of a fire, persons on using the 'phone merely say—Fire! and, without waiting to give their address, replace the receiver and await the arrival of the fire brigade, which, of course, never comes." But I would point out the instruction in the London Telephone Directory is ambiguous in this respect, as will be seen by the extract which follows:

EMERGENCY SERVICES. (FIRE, AMBULANCE, POLICE.)
If in case of emergency the Fire, Ambulance, or Police service is required, all that is necessary is to answer the telephonist's query "Number, please?" with the word, "Fire," "Ambulance," or "Police," as the case may be. *Do not give number.* (See instructional headlines.)

I suppose this means: "Do not stop to give the number of any fire station, but give your own name and address and number"; but it could be read: "Do not give any number at all."

I am, Sir, yours faithfully,

F. W. W.

*** In a letter just issued to the press by the Chairman of the Metropolitan Boroughs' Traffic Subcommittee, it is stated that in case of accident the telephone exchange should be asked for "ambulance"; no number is required and no charge is made for the call, whether it is made from a public call office or from a private telephone. As soon as the caller gets through to the headquarters of the Ambulance Service, *particulars as to the locality of the accident or illness should be made together with the name of the caller.* To enable premises upon which a telephone is available to be readily identified, the London County Council have prepared indicating tablets containing the letter "A" which will be placed outside premises, from which, by the courtesy of the occupants, an ambulance may be summoned. Telephone subscribers who are willing to assist in this direction are asked to send their telephone numbers and addresses to the Officer in Charge of the Service, 94, Southwark Bridge-road, S.E. 1.—ED. L.